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ABSTRACT

The Connecticut Business and Industry Association's (CBIA's) Statewide Workplace Literacy Program was designed to provide customized basic skills training to adult workers. A full-time workplace literacy coordinator met with company steering committees to identify the company's goals for the training, promote the program internally, select participants, and schedule training. Customized curriculum was developed for each of the seven sites. A total of 643 participants were trained during the 18 months of the project. Education service providers developed and implemented the education component of the program and implemented educational counseling services. The workplace literacy training encompassed the following: math skills; team building, communications, and problem solving; integrated workplace literacy basic skills training; and reading skills. A workplace literacy handbook was developed. Evaluators commented on the effectiveness of CBIA as administrative agent, the cohesiveness of the project, and effectiveness of service providers. (Appendixes to the seven-page report are as follows: summary of company training programs; sample customized training materials; evaluation report; news article; prior performance reports; and the Workplace Literacy Handbook that discusses steps in organizing a program and provides program descriptions, information on education service providers who develop workplace literacy programs, and a resource list of materials and publications regarding workplace literacy.) (YLB)

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FINAL PERFORMANCE REPORT
CONNECTICUT BUSINESS AND INDUSTRY ASSOCIATION'S
STATEWIDE WORKPLACE LITERACY PROJECT
DECEMBER 1992

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FINAL PERFORMANCE REPORT
CONNECTICUT BUSINESS AND INDUSTRY ASSOCIATION'S
STATEWIDE WORKPLACE LITERACY PROJECT
DECEMBER 1992

INTRODUCTION

In 1990, the CBIA Education Foundation received funding from the U.S. Department of Education to institute comprehensive workplace literacy training for seven member companies.[1] The purpose of CBIA's Statewide Workplace Literacy program was to provide customized basic skills training to adult workers who have inadequate basic skills and are currently unable to perform their jobs effectively or are ineligible for career advancement due to an identified lack of basic skills.

All seven manufacturing companies had uncovered the basic skills deficiencies of their workers a as a result of implementing Total Quality Management (TQM) processes. Although the TQM program differs from company to company, it requires interpersonal skills (such as team building, communications, negotiation, etc.) and strong mathematics, problem-solving, critical thinking, reading and writing skills needed for increasingly sophisticated manufacturing jobs.

GRANT OBJECTIVES

CBIA's grant from the US Department of Education focussed on seven objectives:

OBJECTIVE 1: To hire a Workplace Literacy Coordinator to assess business needs of these seven companies and facilitate workplace literacy services with service providers

OBJECTIVE 1 OUTCOME: CBIA hired a full-time workplace literacy coordinator in May, 1991. The coordinator met bi-weekly with personnel (referred to hereafter as "company steering committees" from each of the seven companies throughout the duration of the grant. Each steering committee included human resources staff, production and manufacturing managers company foremen, Quality manager, union representatives, education service providers (administrator and instructor), adult learners, and the CBIA Workplace Literacy Coordinator.

Under the direction of the CBIA Workplace Literacy Coordinator, and in conjunction with each company steering committee, decisions were made regarding the following:

- Identifying the company's goals for the training: Prior to undertaking a literacy audit and employee assessment, the coordinator assisted the company in articulating the types

[1] Canberra Industries, Electric Boat, Wiremold Company, Taylor and Fenn Company, Ensign Bickford Industries, Ulbrich Stainless Steel and Special Metals, Inc., and Connecticut Spring and Stamping Company.

of workplace literacy training that would be most beneficial to the present and future productivity of its workforce.

- Promoting the program internally: Each steering committee discussed the best way to "market" and move forward internally with the workplace literacy training.

- How to select participants: The culture within each company varied widely in regard to the best way to select individuals for training. Some of the participating companies preferred to seek volunteers for the workplace literacy program and others preferred to mandate the training for all employees.

- Logistics and Training Details: Each company steering committee assisted with the internal details related to scheduling training times, rearranging employee schedule to accommodate production priorities and identifying classroom space.

OBJECTIVE 2: To pilot-test different workplace literacy basic education programs in two regions of the state with one large defense company Electric Boat in New London and up to ten small manufacturing companies in Greater Hartford servicing at least 500 employees over the 18 month initial start-up period.

OBJECTIVE 2 OUTCOME: US Department of Education staff requested that training not take place at more than seven sites, rather than the 11 originally requested by CBIA. A total of 643 participants were trained in the seven company programs during the 18 months of the project, exceeding the original objective by 29%. Descriptions of the training programs at each site are included in Appendix A of this report. Customized curriculum was developed for each of the seven sites.[2]

OBJECTIVE 3: To provide basic skills education programs at the above noted sites, offering on-site educational services, flexible scheduling and support services such as transportation, day care, and educational counseling.

OBJECTIVE 3 OUTCOME: All of the workplace literacy training was delivered on-site at the companies during company time. Company personnel responsible for assisting with the logistics of the training made every effort to accommodate and rearrange employee shift schedules so that all interested employees could participate in the training. A small population of employees on workers compensation benefits availed themselves of transportation services which were paid for internally, not through grant funding, at Electric Boat.

All education service providers implemented educational counseling services, in conjunction with company human resources personnel, to provide linkage with workplace literacy training and potential job advancement.

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[2]Samples of the customized curriculum for selected companies are included in Appendix B.

OBJECTIVE 4: To offer these workplace literacy services in cooperation with the major workplace literacy providers, including the Connecticut Education Department, Regional Education Serivce Center, and the Community/Technical Colleges Business and Industry Services Network.

OBJECTIVE 4 OUTCOME: CBIA used the services of the Capitol Region Education Council's Workplace Adult Literacy Center (a regional education service center) and the Business and Industry Services Network of the Community and Technical Colleges, including Greater Hartford Community College, Tunxis Community College and Mohegan Community College. The Connecticut Department of Education also served as a resource to the project by (1) providing information on potential assessment strategies and (2) providing information regarding adult education classes that employees could sign-up for in addition to the on-site services within the grant.

The education service providers were responsible for the development and implementation of the education component of the workplace literacy training program, including:

o standardized and customized testing of employees entering the classes;

o implementation of the task analysis (literacy audit) within each company to determine the competencies that needed to be incorporated in the classroom curriculum;

o development of the customized curriculums for each company training program;

o hiring and supervision of certified instructors; and

o evaluation of individual performance of class participants and instructors.

OBJECTIVE 5: To develop a long-term agenda for workplace literacy in Connecticut through the Workplace Literacy Board and to create and to sustain useable and cost-effective workplace literacy services tailored to the needs of individual businesses.

OBJECTIVE 5 OUTCOME: In the original grant negotiations, US Department of Education requested that the concept for a Workplace Literacy Board be deleted from the grant proposal. Companies did receive cost-effective and useful literacy services -- for example, all participating companies plan to continue to provide workplace literacy training services after the expiration of grant funds. In addition, the CREC Workplace Adult Literacy Center is able to provide additional funding through the Connecticut Department of Education matching fund to assist with cost-effective service delivery.

OBJECTIVE 6: To establish a statewide Literacy Board through CBIA comprised of state legislators, education leaders, representative of professional organizations, workplace literacy providers, and CEO's of individual businesses to define

effective procedures and practices for workplace literacy.

OBJECTIVE 6 OUTCOME: In the original grant negotiations, US Department of Education requested that the concept for a Workplace Literacy Board be deleted from the grant proposal.

OBJECTIVE 7: To conduct an ongoing assessment of the pilot project and the statewide Workplace Literacy Board and to obtain quantitative data on employee skills acquisition in the pilot workplace literacy sites.

OBJECTIVE 7 OUTCOME: Professor Andrew Hahn, Brandeis University and John Cimarosa, Consultant carried out field visits and an overall evaluation of the program. Please see their evaluation which is contained in Appendix C.

TIMETABLE OF EVENTS

All components of the workplace literacy training as described in CBIA's 18-month project timetable were completed on schedule. Per the revisions by the USDOE staff, only 7 companies participating in the training and the statewide Workplace Literacy Board was deleted from the grant's objectives.

CHARACTERISTICS OF PROJECT PARTICIPANTS

Overall, the percentage of workplace literacy training delivered in the grant included 31% math skills, 26% teambuilding,communications and problem-solving; 23% ESL; 17% integrated workplace literacy basic skills training (e.g., a combination of reading and math); and 3% reading skills. Please see Appendix C for participant break-down by gender, race/ethnicity, age, educational background, wage rate and assessment results.

Taylor and Fenn Company
- English-as-second language for 46 employees

Canberra Industries
- Math skills, writing and team-building, communications and problem-solving training for 205 employees.

Ulbrich Stainless Steel
- Primarily math skills training, reading and ESL for 71 employees.

Ensign Bickford Industries
- ESL, math, and reading for 133 employees.

CT Spring and Stamping
- Math, ESL and team-building, communications and problem-solving for 60 employees.

Wiremold Company
- Math, ESL, reading and problem-solving for 32 employees.

Electric Boat
- Math, ESL, and reading for 96 employees.

DISSEMINATION ACTIVITIES

The coordinator of the CBIA Statewide Workplace Literacy Project undertook multiple means of disseminating the project activities including:

- Numerous speaking engagements at conferences and seminars such as:

  The Association for Training and Development, October 28, 1991. The workshop included the workplace literacy coordinator, a representative from Canberra Industries and the CREC Workplace Adult Literacy Center (education service provider).

  Connecticut Foreign Language Teachers Conference, October 1991. Presentation by workplace literacy coordinator.

  The Connecticut Business Roundtable Education Symposium, November 4, 1991. Workshop included the workplace literacy coordinator, a representative from Ensign Bickford Industries and Tunxis Community College (education service provider).

  The Connecticut Association of Adult Continuing Education, April 1992. Workshop included the workplace literacy coordinator, a representative from Electric Boat and CREC Workplace Adult Literacy Center.

- An article written for the September 1991 issue of the CBIA News describing the grant project's activities (see Appendix D) that was received by 7,000 CBIA member companies.

- Development and distribution of a Workplace Literacy Handbook that was sent to 3,000 CBIA member companies describing the activities of the USDOE grant (enclosed).

- Roundtable Discussions with key state officials (State Department of Education, State Department of Labor, Regional Education Service Center staff); company participants and education service providers regarding pertinent issues of workplace literacy training.

EVALUATION ACTIVITIES

The goal of the evaluation plan for the CBIA grant included the collection of qualitative and quantitative data on Workplace Literacy Project objectives to determine individual company success and overall project implementation success. The evaluators were responsible for compiling quantitative and qualitative data for each of the seven participating companies.

Quantitative data collection included:

- general information on adult workers served in each classroom module
- number of workers served in each classroom module
- educational level attained
- attainment of classroom skills
- age of participating workers
- ethnic group
- number of years with company

Qualitative data was collected through surveys, given to employee supervisors which requested information regarding the following:

- improvement of workers skills
- better preparation of workers for changes in the workplace (introduction of new technology, total quality production, cross-training, ability to work in teams, ability to communicate)
- employee-readiness for promotions

In their final report, the evaluators also commented on the effectiveness of CBIA as administrative agent; cohesiveness of project (CBIA as broker, company interaction, communication, service provider interaction); and the effectiveness of service providers.

CHANGES IN KEY PERSONNEL

The project director was Lauren Weisberg Kaufman, director of education and training for the CBIA Education Foundation throughout the duration of the grant. Janet Daisley was hired as project coordinator in May 1991 and remained in that position throughout the duration of the grant. The evaluator named in the original grant was Anne Wingate, Director of the State Council on Vocational/Technical Education. Ms. Wingate, due to other work considerations, could not serve as evaluator to the grant. Professor Andrew Hahn, Brandeis University and John Cimarosa, Consultant were hired as the evaluators to the grant in July 1991 and served in this capacity throughout the duration of the grant.

CONCLUSIONS

The implementation of the USDOE grant resulted in high quality, cost-effective workplace literacy services to seven companies. As with any pilot project a few obstacles did arise which complicated the smooth implementation of the grant program. In particular, appropriate methods of testing become a hot spot for companies, providers and the workplace literacy coordinator. Most of the providers utilized a standardized assessment instrument to assess employee skills at the on-set of the program. As USDOE staff is well aware, none of the standardized tests currently available accurately assess workplace competencies related to specific manufacturing jobs. The standardized assessment instruments do not provide an accurate

learning picture of competencies gained through a customized workplace literacy curriculum.

The CBIA workplace literacy coordinator encouraged the CREC Workplace Adult Literacy Center to pilot customized testing instruments, in addition to their usual standardized assessment instrument, to see if better testing results could be obtained regarding adult learner performance. Although the customized tests better assessed individual performance, they could not be correlated or validated across participating companies. Therefore, it became very difficult to have any qualitative data that accurately reflected true learning gains for individual participants and across companies.

Aside from the testing issue, the implementation of the grant program was affected by the difficult economic recession facing Connecticut employers. Numerous "downsizing" of company personnel across all 7 participating companies continued to affect class size and participant continuity.

The CBIA Statewide Workplace Literacy initiative received high marks from all the company personnel involved with the project. Personnel from the companies have agreed to continue the training after the expiration of the grant funding. ***In addition, strong support financially was demonstrated as the seven companies provided $290,303 in direct dollars and in-kind support for the project. This equates to a 73% match to federal dollars for the program.***

APPENDIX A

APPENDIX A: SUMMARY OF COMPANY TRAINING PROGRAMS

Canberra Industries

Canberra Industries is a midsize company in Meriden that manufactures radiation detection equipment. In 1991 company management decided to restructure production from an assembly line- based manufacturing process to a team-based structure. This restructuring amounted to a radical change from the old production method, where an employee was responsible for only one step in the production process. In addition, employees increasingly were being asked to use math skills as they assembled the complex electrical circuitry in radiation detection equipment. To meet these needs, the workplace literacy training program at Canberra was developed in conjunction with the Capitol Regional Education Council Workplace Adult Literacy Center (CREC WALC).

CREC WALC developed a curriculum that began with team-building and communications training for all 80 production employees. The interpersonal skills training became an important component of the curriculum, as production workers were unaccustomed to such interaction after years of assembly-line work. The team-building component was developed to enhance worker productivity, communication and cooperation.

From October 1991 to July 1992 all employees participated in customized math classes, guided by the literacy audit, to upgrade skills to the levels needed at that time and build skills to the level required to successfully function over the next five years at Canberra. In addition, writing courses were provided to help with developing memos and short, analytic reports. The steering committee at Canberra has been very active in identifying "real" work situations to be included in the team-building module, and has provided access and information for the literacy audit and curriculum.

Connecticut Spring and Stamping Corporation (CSSC)

Connecticut Spring and Stamping Corporation is a manufacturer of specialized springs and metal stampings. The company has a large number of workers who have been with the company for more than 15 years and who have performed the same job throughout that time period. In addition, supervisors who have traditionally been the production decision makers are now being required to lead teams that make joint decisions regarding production schedules and product quality.

The workplace literacy program, developed by Tunxis Community College's Business and Industry Services Center, reflects the goals of CSSC's total quality management program. A comprehensive literacy audit was performed with the support and input of the company's chief executive officer and upper management, and now serves as the "blueprint" for company training needs. The audit identified skills that were currently needed and skills that will likely be needed over the next five years. The 18 months of training included a component to enhance supervisor

interpersonal skills (communication and team-building); a math curriculum which focused on the math skills needed to use statistical analysis in the workplace; and an English-as-a-second-language class to help non-native employees improve their communication skills.

Ensign Bickford

Ensign-Bickford Industries (EBI) is a diversified manufacturer whose leading products are non-electric explosive initiation systems used in the mining, quarrying, construction, gas and oil industries. Due to the nature of the product, strong communication, reading and math skills are essential for the safe production of quality products. Over 75 employees have received basic skills training, which will serve as the foundation for employee participation in the company's Total Quality Management (TQM) program.

The Job Skills Enhancement Program (JSEP), developed by Tunxis Community College to provide remediation in identified employee skills gaps. A process of job analysis for literacy and math requirements, pre-assessment, counseling, remediation, post-assessment and follow-up was conducted for multiple job classifications within the company. The JSEP encompasses a five-step process: English-as-a-second-language (ESL) for employees with limited English proficiency; basic skills training in math, reading and writing using customized curricula; participative skills training in communications, team building, valuing work force diversity, etc.; TQM skills instruction in pre-control, Statistical Process Control, quality improvement tools, etc.; and team-directed work education. EBI's continuing commitment to upgrade employees' skills has recently culminated in the establishment of a computer-aided instruction lab using state-of-the-art computer-based training for ESL and basic skills remediation.

Electric Boat

Electric Boat (EB), a division of General Dynamics, produces submarines for the U.S. Navy. The workplace literacy training at EB has been organized and monitored by a strong steering committee, including representatives from the Apprenticeship School, the Metal Trades Council, the Workers' Compensation Division, Mohegan Community College and the Connecticut Business and Industry Association.

The workplace literacy program, developed by Mohegan Community College, focuses on improving basic skills using a customized curriculum specific to E.B.'s highly technical job classifications. The 18-month program has included continuous cycles of English-as-a-second-language, math, reading and writing skills for workers such as painters, grinders, welders, outside machinists, laggers, carpenters, and pipe-welders. The Electric Boat workplace literacy program will continue to operate as the Skills Enhancement Center after the grant funds expire.

Taylor and Fenn

Taylor and Fenn is New England's largest foundry. The work environment requires that employees pay careful attention in the noisy environment as heavy equipment transports hot iron

and other types of manufactured products. Accurate and effective communication is critical for preventing accidents and improving productivity between non-native and native employees. Taylor and Fenn has a large population of Portuguese employees who will all participate in teams by 1992 (per the Continuous Improvement program at Taylor and Fenn). The workplace literacy training program that CREC WALC has developed at Taylor and Fenn is a 36-week English-as-a-second-language course, customized to production jobs within the foundry. Successful program outcomes include employees who have been promoted to customer service jobs that require English skills; employees conversing in English with supervisors; and their increased ability to interact in teams.

Ulbrich Stainless Steels and Special Metals, Inc.

Ulbrich is a precision reroll strip and wire mill that is supported by four service centers throughout the country. The company specializes in producing strip and wire to exact specifications for the worldwide marketplace, including the aerospace, automotive, electronic, defense, medical, industrial, mechanical and consumer products industries.

Comprehensive education and training programs are associated with the company's Total Quality Management program. The Workplace Literacy Program at Ulbrich primarily addressed the fundamental need for workplace math skills development through customized non-supervisory and supervisory-level curricula, all in preparation for the implementation of Statistical Process Control and further advanced technology training. In addition, a reading program and an English-as-a-second-language program were implemented to increase workplace communication skills. Pre- and post- program results showed significant skill increases characterized by increased ability to prevent deviations from quality standards as well as by more rapid error identification and corrective action.

Wiremold Company

Wiremold Company manufactures metal and plastic "raceways" and electrical outlet fixtures for the building construction industry. The company has instituted a Total Quality Productivity (TQP) program in an effort to make the production process more efficient and cost-effective. One of the goals of Wiremold's TQP program is to cross-train assemblers and machinists to build a more flexible work force.

The workplace literacy program at Wiremold Company was developed by Greater Hartford Community College. The training at Wiremold Company has a variety of components. One group of employees who are organized into a work cell are going through 36 weeks of English, reading, mathematics and problem-solving training. The curriculum incorporates workplace information that the cell team members use throughout the work day. In addition, the participants will learn problem-solving techniques using actual problems from the production line. Curricula have been developed for math and reading courses so that employees can improve skills for assembly and production work.

APPENDIX B

TAYLOR & FENN ESL PRE-TEST

NAME _____ DATE _____

I. CIRCLE THE WORDS AS THE TEACHER SAYS THEM.

slag clean	aluminum	mallet
spats	sprues	vents
refractories	basins	crane
patterns	respirators	scarf
broken cores	air hose	points

II. MATCH THE WORD WITH ITS MEANING

A. goggles	protects head from injury
B. alcohol	a hammer
C. mallet	protects eyes during work
D. helmet	a liquid without color
E. generator	a tool
F. chisel	a machine

III. READ THE COMPANY POLICY ON HOLIDAYS

HOLIDAYS

1. **Qualifications for Paid Holidays**

   ONLY FULL TIME EMPLOYEES ARE ELIGIBLE FOR HOLIDAY PAY

2. **Paid Holidays**

   THE FOLLOWING HOLIDAYS SHALL BE OBSERVED BY ALL FULL TIME EMPLOYEES, WHO HAVE COMPLETED 60 DAYS OF CONTINUOUS SERVICE, WITH PAY

NEW YEAR'S DAY	LABOR DAY
GOOD FRIDAY	THANKSGIVING DAY
MEMORIAL DAY	CHRISTMAS DAY
INDEPENDENCE DAY	(4) FLOATING HOLIDAYS

---

3. Who gets paid holidays ?

   A. All workers
   B. Part time workers
   C. Full time workers
   D. Full time workers with 60 days of service.

4. Which of these is not a paid holiday ?

   A. Thanksgiving
   B. Christmas Eve
   C. Labor Day
   D. A floating holiday

IV. READ THE FOLLOWING SAFETY RULES

GENERAL SAFETY RULES

1. Report all injuries to your supervisor.
2. Report all unsafe conditions.
3. Safety glasses must be worn at all times in the foundry.
4. Keep fire exits clear.

---

5. Where should safety goggles be worn ?

   A. In the office.
   B. Everywhere
   C. In the foundry
   D. In the factory

6. Who should injuries be reported to ?

   A. Co-workers
   B. Personnel office
   C. President
   D. Supervisor

V. READ THE FOLLOWING POSTER

CLEAN - UP NOTICE

BEFORE THE END OF THE WORK DAY WORKERS MUST

1. Put all tools away.
2. Clean up work station.
3. Sweep the dirt from the floor.

---

7. After workers sweep the floor after they _____ ?

   A. Clean work area.
   B. Put away tools.
   C. Finish work.
   D. After they put away tools and clean the work area.

8. When should tools be put away ?

   A. Before the work station is cleaned up.
   B. In the morning.
   C. Before lunch.
   D. After lunch.

VI. READ THE PERFORMANCE APPRAISAL BELOW.

THE TAYLOR & FENN COMPANY
PERFORMANCE APPRAISAL

NAME John Smith DATE 9/21/91 DEPT Foundry

PERFORMANCE AREA	BELOW AVERAGE	AVERAGE	ABOVE AVERAGE
1. COMMUNICATION		X	
2. ATTENDANCE	X		
3. SAFETY		X	
4. WORK QUALITY			X

9. John's lowest rating is ____ ?

A. Communication
B. Attendance
C. Safety
D. Work Quality

10. John is average in _____ ?

A. Attendance
B. Safety
C. Work Quality
D. All areas

VII. READ THE NOTE BELOW

Tony,
Please check on the small bracket ord. no. S197. No one can locate it. Leave a note on my desk for the morning shift.

Mike

11. Tony's boss wants him to ___ ?

A. Check in with his boss.
B. Complete his work.
C. Call him at home.
D. Check on order #S197

12. How should Tony let Mike know about the order ?

A. Leave him a note.
B. Call him at work.
C. Call him at home.
D. Leave the order on his desk.

VIII. WRITE A NOTE TO TONY TELLING HIM THAT THE ORDER HAS BEEN LOST AND YOU WILL CHECK WITH THE SHIPPING ROOM.

---

13. Use the back side of this sheet.

IX. WRITE AN ABBREVIATION FOR THE FOLLOWING WORDS

14. CUSTOMER _____ 15. QUANTITY _____

16. DEPARTMENT _____ 17. NUMBER _____

18. ORDER _____ 18. LOCATION _____

X. FILL OUT THE FOLLOWING FORM.

INSURANCE REQUEST FORM

NAME_____ DATE _____

ADDRESS _____CITY/TOWN _____

EMPLOYER _____ YEARS WORKED _____

Choose the type of insurance you want

Group Health Insurance: _____ Life Insurance: _____

Major Medical: _____ Sickness & Accident: _____

List family members you would like covered

NAME RELATIONSHIP

_____

_____

_____

_____

_____

XI. READ THE REPORT SHOWN BELOW.

MONTHLY SCRAP REPORT

Date	Scrap Reason	Order No.	Cust. No.	Quan	Tot Value
9/30/91	Overgrinding	147561	E278	2	904.00
9/30/91	Cracked	145783	G014	1	1360.00
10/01/91	Core Broke	143761	D034	2	173.00
10/01/91	Dirt	143624	K091	1	425.00

* Turn page for questions.

19. How many scraps were caused by over grinding ?

A. 0
B. 1
C. 2
D. 6

20. What was the scrap reason for order number 143624 ?

A. Overgrinding
B. Core broke
C. Cracked
D. Dirt

XII. READ THE CALENDAR BELOW.

NUMBERED WEEK CALENDAR

O Holiday

- End of Month

__ Shutdown

AUGUST

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

21. The company is shut down for how many days ?

A. 11
B. 9
C. 10
D. 12

22. The end of the month is on what day ?

A. Saturday
B. Friday
C. Sunday
D. Monday

23. How many holidays are there ?

A. 12
B. 11
C. 1
D. 0

24. What is the last day before shutdown ?

A. 24 th
B. 30 th
C. 23 rd
D. 31 st

XIII. READ THE COMPANY POLICY MANUAL BELOW.

TAYLOR & FENN CO. PERSONNEL POLICY MANUAL

Table of Contents

I.	Employee Classification	pp 1
II.	Wages and Salary	pp 3
III.	Benefits	pp 6
IV.	Vacation & Leaves of Absence	pp 9
V.	Staff Regulations	pp 11

25. On what pages would you find information about pay ?

A. pp 1 - 2
B. pp 3 - 5
C. pp 6 - 8
D. pp 9 - 10

26. Pages 6 - 8 would give you information about _____ ?

A. Job classification
B. Vacation
C. Wages
D. Benefits

27. Information on employee problems could be found in

A. Benefits
B. Regulations
C. Wages
D. Vacation

28. Information on Leaves of absence would be found in ___ ?

A. Section V
B. Section IV
C. Section III
D. Section II

Capitol Region Education Council

Workplace Adult Literacy Center
11 Asylum Street
Hartford, Connecticut 06103

(203) 522-9533

Taylor & Fenn Item Analysis - Pre Test

NAME:

	Objective	Raw Score	Minimum Criteria
I.	Identify spoken vocabulary terms	__ / 8	(6)
II.	Match vocabulary terms w/definitions	__ / 6	(5)
III.	Interpreting the Company Policy on Holidays	__ / 2	(2)
IV.	Interpreting general safety procedures	__ / 2	(2)
V.	Interpret sequential directions	__ / 2	(2)
VI.	Interpret an Employee Performance Evaluation	__ / 2	(4)
VII.	Read and interpret a note from a supervisor or co-worker	__ / 2	(2)
VIII.	Write a letter/note to a supervisor	* T.E.L	--
IX.	Write and use job related abbreviations	__ / 6	(5)
X.	Complete a company insurance form	__ / 8	(6)
XI.	Read and interpret a monthly scrap report	___ / 2	(2)
XII.	Read and interpret the monthly company calendar.	___ / 4	(3)

* Teacher Evaluation Letter

Capitol Region Education Council is an Equal Opportunity Agency

Answer the following questions about the Taylor and Fenn company. Read your hand-out to find the answers.

1. Who is the night operations manager?

2. What is Fred Nunes' job?

3. Who is the president of Taylor and Fenn?

4. What is Susan Carrabbia?

5. Who is the manager of production?

6. How many people are listed in sales and administration?

7. How many people manage the foundry?

8. What is Mr. Gardziel's first name?

9. Who is at the top of the chart?

10. Who is at the bottom of the chart?

11. What is Len Sibley's job?

12. What is admin. an abbreviation for?

13. What is the purpose of this chart?

Ulbrich

Mathematics Curriculum

Basic Skills

I. Decimals

100% a. Reading Decimals
92% b. Writing Decimals
100% c. Comparing Decimals
100% d. Changing Decimals to Fractions
100% e. Changing Fractions to Decimals
100% f. Addition of Decimals
100% g. Problem Solving - Adding Decimals Applications
100% h. Subtraction of Decimals
92% i. Problem Solving - Subtracting Decimals Applications
100% j. Multiplication of Decimals
92% k. Problem Solving- Multiplying Decimals Applications
92% l. Division of Decimals
100% m. Problem Solving - Dividing Decimal Applications

II. Percents

100% a. Writing Percent Notation
85% b. Converting from Percent Notation to Decimals and Fractions and vice versa
85% c. Translating Percent Problems to Proportions
92% d. Solving Percent Problems
92% e. Solving Percent Reduction Problems

III. Integers

92% a. Addition of Integers
100% b. Subtraction of Integers
92% c. Multiplication of Integers
100% d. Division of Integers

IV. Measures of Central Tendencies

92% a. Learning About Averages
100% b. Calculate the Mean
86% c. Problem Solving - Calculating the Mean Applications
d. Rank Order
92% e. Calculate the Median and Mode
100% f. Problem Solving - Calculating the Median Applications

Tables and Graphs

V. Tables

100% a. Reading Tables
b. Using and Interpreting Tables

VI. Circle Graph

75% a. Working with Circle Graphs
b. Comparing Circle Graphs
c. Converting from Tables to Graphs
d. Problem Solving -Developing a Circle Graph Using Company Data

VII. Bar Graphs

100% a. Reading Bar Graphs
b. Converting from Tables to Bar Graphs
c. Reading a Double - Bar Graph
d. Problem Solving - Developing a Bar Graph Using Company Data

VIII. Line Graphs

92% a. Reading Line Graphs
b. Reading Double - Line Graphs
c. Problem Solving - Developing Line Graphs Using Company Data

IX. Histograms

100% a. Reading A Tally Table
b. Frequency Tables
c. Histograms
d. Develop Histograms
e. Grouping Data Using A Histogram
f. Problem Solving - Developing Histograms Using Company Data

X. Pareto Chart

a. Reading A Pareto Chart
b. Converting from a Tally Table to a Pareto Chart
c. Developing Pareto Charts
83% d. Problem Solving - Developing Pareto Charts Using Company Data

Ulbrich Worksheet- Percents

(1) JP Morgan company is a customer of Ulbrich. During 1991 Morgan's account with Ulbrich totaled $112,000. They informed Ulbrich that they plan to increase their sales by 30% during 1992. What will their total sales be at the completion of 1992?

(2) In 1986 Ulbrich had 330 employees. BY the end of 1988, the number of employees had increased to 540. Find the percent of increase in employees.

(3) During a two year period, workers' average hourly earnings rose from 18.70 to 19.5. What percent if increase is that?

(4) You are required to be no more than 8% over the order. The order calls for 525 pounds. How much can you produce without going over?

(5) The temperature of a machine was reduced by 15%. If the machine as run @ 425 degrees, what has it been reduced to?

(6) Ulbrich's current sales are $48 million annually. Find the projected sales for next year if sales are to increase by 37 1/2% ?

(7) Ulbrich estimates that expenses will increase by 33 1/3% during the next year. If expenses are currently $81 million, how much will the company be spending next year?

Ulrich Problems # 4

(1) The temperature of a machine was reduced by 20%. If the machine was run at @ 370 degrees, what has it been reduced to?

(2) The temperature of a machine was reduced by 30%. If the machine was run @ 420 degrees, what has it been reduced to?

(3) You are required to be no more than 5% over the order. The order calls for 450 pounds. How much can you produce without going over?

(4) You are required to be no more than 10% over the order. The order calls for 575 pounds. How much can you produce without going over?

(5) The material you are annealing has a requirement of a tensile of 100,000 psi max. To calculate the tensile, divide the break load by the cross sectional area of the material. If the break load is 490 lbs, the gauge is 0.0100, and the width is 0.500, what is the tensile?

(6) The material you are annealing has a requirement of a tensile of 140,000 psi. max. To calculate the tensile, divide the break load by the cross sectional area of the material. If the break load is 580 lbs, the gauge is 0.0100, and the width is 0.500, what is the tensile?

(7) The order calls for 2250 pounds. You have 1265 pounds of one heat. How much must you take from another heat to be no more than 5% over the order requirement?

Ulbrich Application Problems

(1) You have a reel of wire that weighs 562 pounds. The customer wants 8 coils, each weighing 40 pounds. You had to scrap 18 pounds due to tangled wire on the coil. How many pounds of wire will you return to stock?

(2) You have a reel of wire that weighs 642 pounds. The customer wants 9 coils, each weighing 50 pounds. You had to scrap 22 pounds due to tangled wire on the coil. How many pounds of wire will you return to stock?

(3) A truck can pick up 2 1/2 tons of material. You have 5522 pounds of material. Can you pick it up using this truck? Why?

(4) A truck can pick up 2 1/2 tons of material. You have 4522 pounds of material. Can you pick it up using this truck? Why?

(5) You are running material at 10 FPM. How many feet will you run in three hours?

(6) You are running material at 30 FPM. How many feet will you run in 4 hours?

(7) You have 2175 ft on a coil which is running at 37 FPM. Your shift ends in 10 minutes. How much material will be left on the coil when you leave and the next shift begins?

(8) You have 1,276 ft on a coil which is running at 36 FPM. Your shift ends in 20 minutes. How much material will be left on the coil when you leave and the next shift begins?

Mean, Median, Mode (Basic)

The mean provides a good measure of central location. It is the average of a set of data found by adding all the data and dividing the sum by the number of items.

The median is the middle value when the data is ranked from lowest to highest.

The mode is the value which occurs with the greatest frequency.

(1) A quality control inspector found the following number of defective coils on 16 different days.

11 14 18 14 21 17 13 21 25 19 17 13 28
13 17 18

Compute the mean, median, and mode.

(2)

Material	Weight
A	258 lbs.
B	306 lbs.
C	225 lbs.
D	306 lbs.
E	369 lbs
F	457 lbs.

Compute the mean, median, mode.

(3)

Coils	Lenght
A	2,645 ft
B	2,678 ft
C	1,456 ft
D	1,835 ft
E	3,008 ft

Compute the mean, median, mode.

(4) The Ulbrich personnel department is interested in studying employee absenteeism. During the month of August, time records show the following results for the number of production workers at the Ulbrich facilty:

13	14	9	17	21
10	15	22	19	13
22	13	19	23	17
21	10	9	20	18

Compute the mean , median, mode.

(5) Ulbrich offers the following thickness on sheets of steel.

0.005 0.125 0.225 0.0325 0.425

Compute the mean, median, and mode.

(6) Ulbrich offers these widths on strips of material.

0.33 0.75 0.25 0.50 0.01 0.04 0.67 0.89

Compute the mean, median, and mode.

(7)

Material	Weight
A	260 lbs.
B	356 lbs.
C	425 lbs.
D	869 lbs.
E	429 lbs
F	973 lbs.
G	260 lbs.

Compute the mean, median, mode.

(8)

Coils	Lenght
A	358 ft
B	657 ft
C	246 ft
D	763 ft

Compute the mean, median, and mode.

Ratio and Proportion (Basic | Sor.)

A ratio is the comparison of two quantities that have the same units. A ratio can be written in three different ways:

1. as a fraction (in simplest form)
2. as two numbers separated by a colon (:)
3. as two numbers separated by the word TO

Example: Write the comparison 64 miles to 8 miles as a ratio in simplest form using a fraction, a colon, and the word TO.

$\frac{8}{1}$ 8 : 1 8 TO 1

Example: Write the comparison 20 pounds to 24 pounds as a ratio in simplest form using a fraction, a colon, and the word TO.

$\frac{20}{24}$ | $\frac{5}{6}$ 5:6 5 TO 6

Write the comparison as a ratio in simplest form using a fraction, a colon, and the word TO.

1. 3 feet to 15 feet
2. 6 pounds to 8 pounds
3. 3 in to 4 in
4. 25 cents to 100 cents
5. 32 parts 68 parts
6. 8 tons to 16 tons
7. 28 days to 20 days
8. 12 months to 12 months

Rates

A rate is a comparison of two quantities that have different units. A rate is always written as a fraction in simplest form.

Example: Write 15 pounds of fertilizer for 12 trees as a rate in simplest form.

$\frac{5 \text{ pounds}}{4 \text{ trees}}$

Unit Rate

A unit rate is a rate in which the number in the denominator is 1. To find unit rates, divide the number in the numerator of the rate by the number in the denominator of the rate.

Example: Write 260 miles in 8 hours as a unit rate.

32.5 miles/ hour

Write as a rate in simplest form.

1. 300 miles on 15 gallons
2. 30 ounces in 24 glasses
3. $80 for 12 boards
4. 88 feet in 8 seconds
5. 20 feet in 8 reels
6. 25 ounces in 5 minutes

Write as a unit rate.

1. 10 feet in 4 seconds
2. 816 miles in 6 days
3. $1300 earned in 4 weeks
4. 388.8 miles in 8 hours
5. $349.80 for 212 pounds
6. $11.05 for 3.4 pounds

Proportion

A proportion is the equality of two ratios or rates.

$$\frac{50 \text{ miles}}{6 \text{gallons}} = \frac{25 \text{ miles}}{3 \text{ gallons}}$$

A proportion is true if the fractions are equal when written in lowest terms.

Is this proportion true?

$\frac{3}{4} = \frac{12}{16}$ In a true proportion the product of the extremes equals the product of the means. (cross multiply)

Determine if the proportion is true or false.

1. $\frac{4}{8} = \frac{10}{20}$ 2. $\frac{39}{48} = \frac{13}{16}$ 3. $\frac{7}{8} = \frac{11}{12}$

4. $\frac{16}{3} = \frac{48}{9}$ 5. $\frac{15}{5} = \frac{3}{1}$ 6. $\frac{7}{40} = \frac{7}{8}$

Sometimes one of the numbers in a proportion is unknown. In this case, it is necessary to solve the proportion. This means to find a number to replace the unknown so that the proportion is true.

Example: $\frac{n}{14} = \frac{3}{7}$

$7n = 42$

$n = 42 \div 7$

$n = 6$

Solve. Round the nearest hundredth.

1. $\frac{n}{4} = \frac{6}{8}$ 2. $\frac{n}{7} = \frac{9}{21}$ 3. $\frac{12}{18} = \frac{n}{9}$

4. $\frac{6}{n} = \frac{24}{36}$ 5. $\frac{3}{n} = \frac{15}{10}$ 6. $\frac{n}{45} = \frac{17}{135}$

7. $\frac{n}{15} = \frac{21}{12}$ 8. $\frac{40}{n} = \frac{15}{8}$ 9. $\frac{32}{n} = \frac{1}{3}$

10. If you can run a 4,000 ft coil in 90 minutes, how many feet can you run in 30 minutes?

11. A machine takes two hours to complete one part. At this rate, how many parts can the machine produce in 4 weeks. One week equals 40 hours?

12. If an employee is producing 600 parts a week. At this rate how may parts will this employee produce in 50 weeks?

13. If 10 parts are rejected at inspection per shift, how many are rejected per year? (This company has two shifts) Employees work 240 days a year.

14. From previous experience, a manufacturer knows that in an average production run of 2000 circuit boards, 60 will be defective. What number of defective circuit boards can be expected from a run of 25,000 circuit boards?

(15) If you can run a coil at 28 feet per minute, how many feet can you run in 120 minutes?

APPENDIX C

WORKPLACE LITERACY

AN EVALUATION OF THE CBIA WORKPLACE LITERACY INITIATIVE

November 1992

by

Andrew Hahn &
John Cimarosa

INTRODUCTION

For the individual, workplace literacy skills, including reading, writing, computation, and problem solving, as well as employability skills such as interpersonal competence, reliability and adaptability are essential for successful job performance. For the company, these skills are the key to a "high quality, high wage, high skills" workforce which can compete domestically and internationally in an economy that places a premium on productivity. Now a national priority, workplace literacy programs are being developed jointly by business, industry, unions and educational providers. Much of this activity has been stimulated by the federal government through legislation, including the Job Training Partnership Act (1982), the Job Opportunities and Basic Skills program of the Family Support Act (1988), the National Literacy Act passed in 1991, and special programs in the Department of Education.

A partnership in this tradition has developed in Connecticut. Organized by the Connecticut Business and Industry Association (CBIA), seven private firms were selected to receive small federal grants from the U.S. Department of Education for workplace-based learning initiatives. Seen by the companies as an opportunity to upgrade the quality of their workforce as part of total quality management activities, the workplace initiative was enthusiastically greeted and launched. CBIA served as the intermediary for this project in the state of Connecticut. The demonstration ran 18 months from April 1991 through September 1992.

The present report is just one part of an ongoing evaluation of the CBIA initiative organized by CBIA itself. CBIA selected and monitored the programs; it wrote progress reports, performed site visits, established quality control mechanisms; and, it established that the goals of the project were met in a timely and effective manner. To assist CBIA, it contracted with the consultants for a modest level of effort. The consultants' job was largely to describe the kinds of individuals involved in the projects, to describe the activities the workers participated in, and to provide some very tentative findings about impacts, as well as some issues that became apparent to the researchers during the project. A more rigorous (and costly) evaluation would require control or comparison groups, collection of extensive data, and access to information about workers that some firms may find difficult to share with researchers.

Before moving on to the more survey-oriented aspects of the report (Section 2.0), it may be useful to first review some general observations about the effectiveness of the overall program implementation.

1.0 REVIEW OF PROGRAM IMPLEMENTATION

The National Alliance of Business (1992) and many other studies have reviewed effective workplace literacy programs. These reviews, usually based on case studies, have described a number of common characteristics found useful for judging initiatives like the CBIA demonstration. Consider the following conclusions offered by the consultants after field visits and related activities to study program implementation:

1. Effective programs get off the ground and really deliver training! This may seem self-evident but there are many examples of worksite literacy programs that have failed to deliver the services envisioned by their designers. Fortunately, that was not the case in any of the seven sites in Connecticut. CBIA launched a large scale training effort in which well over 500 hundred people received training. All the sites participated. On-site instruction was favored and delivered by the companies or their education provider subcontractors to reduce disruptions to work schedules and to reinforce the importance of education to the companies. In all the CBIA companies, the practice of on-site training was followed.

2. Effective programs provide consistent customized training to their worker trainees. After viewing training classes at each of the seven companies, interviewing staff at the companies and the service providers, the consultants conclude that there appeared to be little difference in the implementation of the services provided by the four service providers for the seven firms. This is not to say that there were not occasional problems along the way, but in all cases, the problems were dealt with effectively by the CBIA intermediary. For example, the providers all conducted literacy audits before training began, all worked with company personnel to customize the curricula to meet the specific needs of each company, and, of course, all providers were involved in providing classroom instruction.

   Quality control in the classroom did become an issue at two sites. At Electric Boat, the original teacher, though highly competent and well liked in the classroom, became erratic (missing classes etc) and had to be replaced. At first, it was difficult for the program administrators at Mohegan Community College to even learn of this problem because Electric Boat is a closed "security" conscious defense contractor; access to the company for normal program monitoring is very difficult. Once discovered however, Mohegan moved quickly to replace the teacher and get the training back on track. At Taylor and Fenn, the service provider, CREC, found that the teacher was not using the customized curriculum that had been developed, but was instead reverting to a more standard ESL curriculum. As a result of this experience, CREC improved its monitoring of instructors.

3. Effective programs use strategic and creative ways to recruit and retain workers in workplace literacy programs. In the CBIA initiative, there were a number of different methodologies used for recruiting trainees. All seemed effective to us. To begin with, in all cases, trainees were paid. Canberra Industries put all their production workers into training (mostly "team building") and made it mandatory. Ensign-Bickford had supervisors determine which workers were to be trained (mostly

ESL) and mandated that they participate. Other approaches sought to identify who might benefit the most from ESL training (Connecticut Spring and Stamping) and then the firms offered training to those people on a voluntary basis -- 90 percent volunteered. Although we do not have enough information to state which approach worked better than others, what we heard at a number of places was that once training began, and workers had experience with it, any reluctance among trainees quickly disappeared. For example, the union representative at Electric Boat, who initially was very suspicious of the training, came to feel it was very worthwhile after seeing it. If workers see that training is truly useful, and that their management supports their efforts to upgrade their skills, then the question of what technique works best is less important than the culture in which the change takes place. In the CBIA projects, an organizational culture in support of training seems to have taken hold in all the sites.

4. Effective worksite training programs customize training to meet the company and workers' particular needs. Customization of the training curriculum to the specific workplace poses several interesting questions for evaluators. Before reviewing these, note that all the companies and service providers in the CBIA demonstration worked diligently to customize their curricula, and did so effectively. For "team building" and math, for which each company had a specific set of requirements, customization was especially important. Sites came up with some interesting approaches in this regard. For ESL, however, it was less clear what customization really meant. Basically, customization in the ESL context was often a specialized vocabulary that workers needed to learn. Carried too far, such workers could conceivably learn to recognize specific signs and phrases used on the work floor, but not really be able to speak and read English. Customization also had an impact on the monitoring of trainee learning. The extent to which the training curriculum was tailored to specific vocabulary or math procedures could make the standard basic skills tests, which are tests of basic rather than specialized skills, useless as a monitoring/evaluation tool. Several of the service providers in the CBIA program met this problem by developing their own customized proprietary tests. While these tests were probably more sensitive to the material actually being taught in the classroom than the national standardized tests, companies and outside evaluators have no way to know what the scores returned by the proprietary tests really mean.

2.0 BASELINE SURVEY RESULTS

The rest of the present report is more data-oriented than the material in the previous section and earlier reports which have focused on field visits, observations and early implementation. The purpose of the present section is to present results from two separate data collection efforts:

-- The evaluators, with CBIA staff, created a baseline management information form to be implemented by the sites, with CBIA's help. The baseline form was designed to reveal information about who is in the programs, the characteristics of participants

both before and after participation in "cycles" of services, and other relevant information.

-- A second data collection effort was centered on a sample of ten participants from each of the seven participating companies. We asked CBIA to help collect information on this group of trainees who were randomly selected by their social security numbers. The information collected on this group sometimes overlapped with the items collected in the baseline survey of all participants, but in other instances, the small sample gives us more detailed information.

Figures 1-2 show the number of people involved in the Connecticut Worksite Literacy Program by participating company. Overall, the initiative was a large one: enrollments numbered 643. CANBERRA enrolled the largest number of people, 205. This was followed by ENSIGN & BICKFORD with 133 trainees, ELECTRIC BOAT with 96, ULBRICH with 71, CT SPRING AND STAMPING with 60, TAYLOR & FINN with 71, and WIREMOLD with 32.

The distribution of training was quite uneven. Two firms -- Canberra and Ensign-Bickford -- made up over 50 percent of the enrollments. Wiremold, on the other hand, trained only 32 people or 5 percent of the total. In future demonstrations, the evaluators would like to see consideration given to setting minimum enrollment levels per firm. Also, guidelines regarding size of firm might be helpful from the funding agencies.

Consider next the approximate cost per trainee using the federal portion of the budget only. With a federal grant of approximately $397,000, the per trainee costs were $617.

Who participated? Nearly two thirds of the participants were men, leaving one third who were female trainees (Figure 3). However, the enrollments of females varied significantly from firm to firm. The largest firms also enrolled the largest share of females: two-thirds of Canberra's enrollments were women (Figure 4) and one third of Ensign-Bickford's enrollments were females. It is difficult to speculate meaningfully about what this selection process means. Is a one third share for women a big or small number? Does it reflect the universe of people needing services, by gender, or does it signal some sort of selection process, perhaps using arbitrary criteria? We simply do not have information to answer these questions.

Figure 5 shows the age range of the trainees. A good number are young workers up to the age 21 (40 percent) and a fifth are over 55 years of age. In the section of the report which describes the characteristics of the randomly selected sample of trainees, we mention that a small but significant percentage of trainees were approaching retirement within a decade. We ask whether it would be helpful to restrict eligibility in projects like this to younger workers given the scarcity of federal dollars for upgrading.

Figure 6 reports on the racial/ethnic background of trainees. Nearly two out of three trainees are white but our site visits revealed that many company workforces were comprised of recent arrivals to the United States, such as Portuguese or Greeks. Only 9 percent of the total sample involved in training, however, was African-American. This finding might be of

interest to the federal funders who may like to see services targeted on especially vulnerable groups in American society. Interestingly, a high share of trainees were from Hispanic backgrounds, 17%, and quite a few Asians were in the initiative (10%) as well. Figures 7-9 show these enrollments by company. Ensign & Bickford and Canberra enrolled the most African-Americans as well as Hispanics. Electric Boat also enrolled a good number of Hispanic origin individuals (29%). One third of all Asian participants worked for Ensign & Bickford.

The typical worker in the initiative earned $13.44 an hour. Clearly, these were workers whom the companies wanted to invest in. Workers were familiar to their employers. They were not new employees or minimum wage workers. Highest average wages can be found in CT. Spring and Stamp, followed by Ulbrich. Figure 10 shows the wage rates for each company.

Another characteristic is education. Figure 11 summarizes the results for nearly the full group. Seventeen percent have less than an eighth grade or less education and one quarter have an education level between ninth and eleventh grade. Thus 41 percent have less than a high school degree. Better information for this variable is found in the discussion of the randomly selected group of 70 below.

3.0 TRAINEE INFORMATION FROM A SPECIAL SURVEY OF RANDOMLY SELECTED INDIVIDUALS

As noted above, budget and confidentiality restrictions prevented the evaluators from interviewing each and every trainee in the Connecticut Worksite Literacy Initiative. Some workers were interviewed in our site visits but these qualitative interviews were not designed to yield systematic data about the characteristics of workers receiving training. Instead, we settled on a strategy in which we asked site coordinators to collect information about 10 trainees, randomly selected, from each of the seven company worksite literacy programs. We created a special questionnaire for this purpose. All of the companies complied with our request for data. The data collection was facilitated by CBIA staff. Since there were seven companies and we asked for information on ten randomly selected persons, most of the following data are based on a foundation of approximately 70 cases.

- **GENDER:** Women comprised 41 percent of those trained (slightly less than the results for the entire group) and men 59 percent. Since the sites were largely free to recruit people whom they wanted or who showed an interest in receiving training, or some combination of the two, the results indicate a difference but perhaps not as large as one would expect if there was widespread preference for one gender group over another.

- **AGE:** In our sample, the average age for the group was 42. About 18 percent of the sample of trainees were young prime age workers, that is, between ages 24 and 30. A quarter were in their 30s, a third were in their 40s, and another quarter were 50 through 63 years of age. Canberra and WireMold did not provide this information.

Of the remaining sites, the site with the most older workers was CT.Stamp. The site with the most young workers was Ensign.

We asked in the previous section whether in a public/private program it is advisable or desirable to restrict eligibility. One might argue that younger workers are the most suitable target of worksite literacy training or that the programs should try avoid serving people who are facing retirement sometime soon. In the random sample, about 8 percent of the group were between the ages of 58 and 62.

- **EDUCATION:** On the basis of the special sample, only a handful of trainees had a college degree -- about 4 percent. One third had a high school degree or GED, and 62 percent had less than a high school degree.

  Should eligibility in initiatives like the present one be restricted by education level of trainees? Does it makes sense to devote scarce federal-private literacy/training resources to people holding college degrees or even high school only degrees? Clearly, there was a significant pool of low education trainees available for the program: in our case, 62 percent of the small sample had less than a high school degree. In the next round of worksite literacy initiatives in Connecticut, consideration should be given to establishing eligibility criteria by education level.

  We looked at the number of years of education completed by those in the "less than high school degree" category. Among those who responded (19 cases), the average education level was nearly the sixth grade (5.8 years of education).

- **LANGUAGE BARRIERS:** Overall, 53 percent of the sample is said to have a second language and/or have problems with using English. In our interviews and observations, we learned that many of the managers see these initiatives as a way to bring first and even second generation foreign workers into the mainstream. As we saw above, the programs do enroll many minority language people. On the other hand, as mentioned previously, enrollments of African-Americans was not as high as might have been expected.

- **READING COMPREHENSION:** We asked how the coordinators or instructors would rate each person's reading comprehension ability. It was estimated that a little over a third (37%) of the sample would fall into the below fifth grade reading level, 40 percent in the fifth-eight grade level, 20 percent in the high school range, and only 3 percent in the post high school category. In about one-third of the cases, the coordinators were likely using educated guesses about these reading levels. In those cases in which the coordinators consulted formal reading tests, 46 percent of the trainees were reading below the fifth grade level, 46 percent were in the fifth-eighth grade range, and 8 percent were in the high school range.

  We conclude from this that the groups selected for training were clearly in need of it. Many have low education and basic skills levels.

- **HOW WORKSITE LITERACY/TRAINING HELPS THE INDIVIDUAL:** We asked of each person in the special sample: "when it is all said and done, will this initiative contribute in a substantial way to this person's:

Job Performance.....	100% yes
Productivity.....	100% yes
Job Advancement.....	85% yes
Safety.....	84% yes
Group Skills.....	81% yes
Attendance.....	68% yes
Retention.....	68% yes

The rankings above show that the coordinators believe that performance and productivity are the primary outcomes to be expected from worksite literacy, followed by advancement, safety and group skills. Somewhat less expected as outcomes are improved attendance and retention. What this seems to be saying is that the training investment is likely to result in improvements in the way people do their jobs and these improvements will help the individual as well as the companies. However, although it is also expected that the training will overcome attendance and job security issues, these factors do not weigh in with as much significance as the other factors.

Another cut at this comes from a question in which we asked, "is worksite training for this particular employee mostly to help him/her do their job . . . perform tasks, or, prepare for future technology?

Almost two-thirds of the sample report that the worksite initiative is mostly to help workers do their jobs better. Only 37 percent cite the second, more long range goal of the worksite training.

- **QUALITY OF WORKERS TRAINED:** We asked the coordinators to rate "whether work supervisory reports would reveal that this person is an .

-- Excellent Employee	41%
-- About Average	57%
-- Less than Average	1%

Clearly the companies did not "waste" worksite based training on employees whom they did not value. In two of the sites, we learned that the average length of time in the firms for the selected workers was about 13 years. This shows, again, that the typical workers selected for training were long-term and valued employees.

Another question asked was, "would you say this trainee is:

-- Very Active (does just about everything offered)	48%

-- Average active 47%
-- Less than active 4%

The results confirm that worksite assistance was targeted on trainees who were perceived as average or above average but not less than average.

Finally, we asked about pre-training average hourly wages. Workers in the small sample averaged $11.57 per hour, slightly less than the average reported above for the entire group.

- **TYPE OF ASSISTANCE PROVIDED:** In the sample of randomly selected individuals, we asked what services the workers received. Many combinations of services were received. But the service that was provided the most (either singly or in combination with other services) was help with MATH SKILLS (70%). This was followed by ENGLISH/ESL (53%) and then COMMUNICATION SKILLS (50%). PROBLEM SOLVING SKILLS (42%) were next, followed by TEAM BUILDING SKILLS (34%) and then INTERPERSONAL SKILLS (24%).

  About 4 percent of the sample of 70 received all six services, 1 percent received 5 services, 28 percent got 4 services, 31 percent received 3 services, 10 percent took 2 services, and 25 percent got only 1 service.

  More ambiguous results for the entire group (baseline survey) are reported in Figure 12. They are ambiguous because they do not consider bundles of services as was described above for the small sample. Nonetheless, this baseline data confirms that math skills are the most frequently offered service.

- **LENGTH OF TIME NEEDED FOR TRAINING:** We asked the coordinators to provide information on a per person basis about "how many hours of workplace training would be needed before your staff would stop thinking of the trainee as someone needing assistance." This variable gives us a flavor for how much investment the coordinators believe is necessary to bring workers' skills up to an adequate level. Only two sites were able to provide this information, Electric Boat and Wire Mold. The average answer from these two sites was 57 hours, reflecting that the individuals chosen for the projects were likely not severely weak in skills.

4.0 A TENTATIVE LOOK AT POTENTIAL IMPACTS:

We collected limited information on potential program impacts from an updated baseline survey, as well as from the special small sample of 70 cases. As mentioned in the introduction, our results are speculative. A proper study would require a formal research design with control or comparison groups, and suitable measures taken pre and post program, not to mention a post-program follow-up period. The small scale of the present study, the sensitivity of the companies to sharing detailed information on trainees with the evaluators, the division between the companies and the literacy providers who helped the companies on a contract basis, and the general inability of the project to dictate standardized

instruments -- all these barriers mean that any results reported in this section should be taken with a grain of salt.

CHANGES IN WAGES: In the small sample, we asked about pre-training wage rates. We also asked about the expected hourly wages within six months after completing training. Four of the sites did not provide reliable answers to these questions. In two sites -- Ensign and Canberra-- the coordinators were able to collect this information or make educated guesses. We were interested in whether the post-training wages would be higher than the pre-training wages. In Ensign, the average wage gain expected was .52 cents. In Canberra, it was expected to be .33 cents. When we asked how much of this wage gain was attributable to the worksite literacy initiative, the coordinators were not able to make such an estimate. Thus we estimate -- admittedly with weak data -- that the worksite based literacy resulted in, at most, wage gains of 42 cents per hour (attributing the entire wage gain of [.52c c/2] to the program, an unrealistic assumption). In any case, on this basis con a typical worker would have to work three fourths of a year (38 weeks) with his salary before "paying back" the federal contribution in the demonstration.

CHANGES IN TEST SCORES: All but two of the sites administered pre and post tests to assess workers' skills. These tests were usually recommended by a subcontractor who was commissioned to run the classroom component of the literacy initiative. Figure 13 lists the education providers hired. The Figure reveals that CREC serviced half of all enrollments through its contracts with participating companies. Tunxis Community College reached nearly one third of the group, Greater Hartford Community College only 5 percent, and Mohegan Community College 15 percent of the total group.

A separate attachment contains field notes and descriptions, as well as actual samples, of the assessment tools used. Sometimes the assessments were given when people completed one cycle of training, perhaps 2-3 days a week for 12 weeks in sessions of up to 2 hours. In other cases, people were tested after multiple cycles lasting 36 weeks or longer. The tests themselves measured different competencies and were scored in special ways.

Nonetheless, we were able to examine the test results for about 185 individuals (about 29 percent of all participants) after first scoring all pre and post tests in percentage terms. For example: a score of "60" percentage points on a pre-test means that the individual got 60 percent of the answers correct. A post-test of 80 points means there has been an improvement (assuming that the programs do not "teach to the test" and that there are no maturational effects, etc.). A difference or gain score can be calculated: in this case, the gain score is 20 points.

Figure 14 reports on the results for 185 matched pre/post tests for five companies. Electric Boat and CT. Spring did not participate in the testing program. All results reported are for people who scored at least a 1 percent correct answer on the pre and post-test. In other words, we eliminated from the analysis people scoring 0 on the tests. The eliminated group were most likely comprised of people who may have severe language problems. For these people, the tests were not appropriate. It is also possible

that some of the people who we recorded as "zeros" may not have taken the tests at all. Therefore we dropped this group form the analysis.

Figure 14 shows several possible results. After calculating a gain score, it is possible that people did not gain at all, or that they gained a little (1-20 percentage points), moderately (21-40 points) or a lot (40 or more points). In fact, half of the group did not gain at all (49%), while the rest were divided nicely among the three categories. Put differently, only 15 percent of the non-zero test takers scored in the high range. Of course, some test takers might have had high pre-tests therefore no room to gain. The average pre-test score for non-zero test takers in each company follows: Canberra 44 points, Ulbrich 39 points, Taylor & Fenn 58 points, Ensign-Bickford 26 points, and Wiremold 34 points. Clearly, there was room to improve from the modest foundation made up of these scores. Recall that half of the sample did not make any positive change.

Figure 15 shows the average gain scores in median values for each of the companies: Ulbrich produced the biggest median gains (44 points), followed by Canberra (32 points), Ensign-Bickford (23 points), Taylor and Fenn (20 points), and Wiremold (11 points). Similarly, Figure 16 shows the median gain scores for each provider. CREC apparently produced the largest gains among trainees. These are all solid gains, but unfortunately, they are concentrated among a few people.

To understand this concentration effect better, consider Figure 17 which reports on the percentage of tested people who do not improve or those who actually lost ground (pre to post) in each of the sites and by provider. We learn from this figure that the gains reported above were generally concentrated in a small number of cases. In Ensign-Bickford and Taylor-Finn, for example, 71 and 67 percentage of all test takers, respectively, did not gain at all. In Canberra and Wiremold, the no-gainer group was 50 percent. Only in Ulbrich did we find a situation in which the no gain group was small (19%). Nearly three quarters of the trainees instructed by Tunxis Community College made no gains.

5.0 CONCLUSIONS

This report mainly examines results from the data collection associated with the project. A few tentative conclusions follow:

-- First and foremost, CBIA performed all its responsibilities in a professional and thoughtful manner. CBIA created an effective service to assess company needs and to facilitate the implementation of the project. This involved the selection of firms, orientations of the managers, the selection of service provider sub-contractors, and the training of the service providers. It also involved help on the design of baseline measures and monitoring tools and provision of technical assistance on an as-needed basis. CBIA made sure that the requirements of the federal grant were met. To summarize, seven sites provided flexibly scheduled on-site workplace literacy in

central and southeastern Connecticut, with necessary support services, under CBIA's guidance.

-- The consultants believe that federal authorities, the next time around, should be asked for clearer guidelines about the size of eligible firms, the size of the training initiative within firms, and the characteristics of potential trainees. Should scarce federal dollars, for example, be spent on upgrading older workers? Is the purpose of worksite literacy programs to help first and second generation immigrant groups with language problems? Should specific groups be given priority, such as women or African-Americans? Should small programs of only ten trainees be allowed given the complexities of managing the initiative and reaching economies of scale? Should college-educated workers be included or excluded from these efforts? We also believe that federal planners should think more about the service providers. Perhaps performance based criteria should be developed for the classroom literacy organizations which work under contract to the firms.

-- The consultants found that the potential wage gains attributable to the initiative were not very promising. Here, however, it must be said that our methodology was pretty rough. Even so, what is interesting is that the private sector coordinators did not themselves predict a big economic payoff to the training.

-- Half of the group tested did not improve at all, from pre to post testing. Gains for the others ranged from 10 to 40 points improvement, depending on the site and the training subcontractor. Since the tests were often proprietary, it is difficult to assess whether these changes are big or small. Common sense, however, suggests that the tests did not detect large changes for most people.

-- Testing was unstandardized in accord with the program requirements and the interests of firms to customize. It is also likely that in some cases the instruments used did not match especially well the competencies actually addressed in the sessions. More sharing of resources across states and among organizations like CBIA running these demonstrations is recommended to identify "best practices" including curricula and measurement tools. Although CBIA provided considerable amounts of technical assistance to the sites, better linkages between CBIA-type groups and national information and assistance resources would be helpful.

-- A management information system which tracks participants, hours of service, cycles of service, and program characteristics would be necessary to really monitor a program of this type. We recognize, however, that a proposal of this sort may conflict with the instincts of private sector firms. But the consultants know of no better way to stimulate quality control.

-- Our field notes cover the need for extensive monitoring and quality control of the service providers under contract to the firms. Although CBIA did a fine job performing these functions, the question of incentives for change should be addressed if another round of worksite literacy initiatives is introduced in Connecticut. What

are the points of leverage and control than an intermediary has? How should these be applied, etc.?

-- The field notes describe the need for corporate planners to think more clearly about what should be taught in worksite-based literacy initiatives. Basic reading instruction, for example, is different than ESL. Similarly, learning work-related phrases is not the same as learning English. What is possible to teach in a very short time in a corporate setting? What is really needed from the company and individuals' perspectives? Although worksite literacy audits were conducted in the present project, the design work for programming must be connected to a realistic appraisal of the time available for training, scheduling and the specific needs of workers.

DISTRIBUTION OF TRAINEES BY COMPANY -- NUMBER

Number= 643

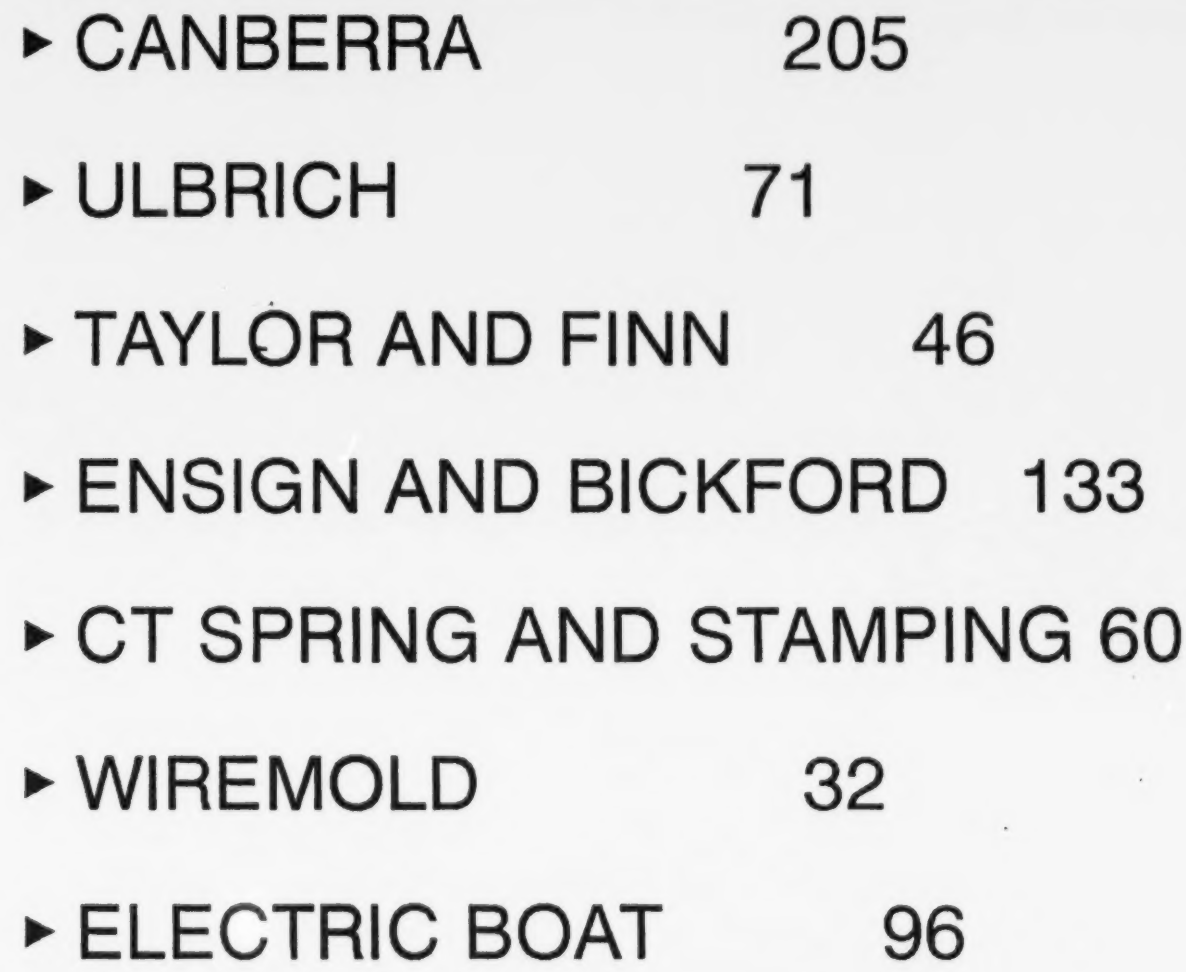


FIGURE 1

From Baseline Survey

PARTICIPATION BY COMPANY

Number= 643

1. Canberra --- 32%
2. Ulbrich ---- 11%
3. Taylor & Finn- 7%
4. Ensign-Bickford --21%
5. CT.Spring and Stamping-- 9%
6. Wiremold -- 5 %
7. Electric Boat --15%

FIGURE 2

From baseline survey

GENDER

Number= 643

1. MALE	65%
2. FEMALE	35%

FIGURE 3

From baseline survey

FEMALE TRAINEES BY COMPANY - PERCENTAGE

- CANBERRA 67%
- ULBRICH 1%
- TAYLOR AND FINN 7%
- ENSIGN AND BICKFORD 32%
- CT SPRING AND STAMPING 23%
- WIREMOLD 48%
- ELECTRIC BOAT 12%

FIGURE 4

From Baseline Survey

AGES OF TRAINEES

Number= 598

1. 14-21 years old -- 40 %

2. 22-39 years old-- 20%

3. 40-54 years old -- 20%

4. 55- over ------- 21%

FIGURE 5

RACE/ETHNIC BACKGROUND OF TRAINEES

Number= 637

1. White 64%
2. African-American 9%
3. Hispanic origin 17%
4. Asian origin 10%
5. Other 1%

FIGURE 6

From baseline survey

AFRICAN-AMERICAN TRAINEES BY COMPANY - PERCENTAGE

- CANBERRA 10%
- ULBRICH 6%
- TAYLOR AND FINN
- ENSIGN AND BICKFORD 13%
- CT SPRING AND STAMPING
- WIREMOLD
- ELECTRIC BOAT 17%

From Baseline Survey

HISPANIC ORIGIN TRAINEES BY COMPANY - PERCENTAGE

- CANBERRA 15%
- ULBRICH 10%
- TAYLOR AND FINN 11%
- ENSIGN AND BICKFORD 26%
- CT SPRING AND STAMPING 2%
- WIREMOLD 3%
- ELECTRIC BOAT 29%

FIGURE 8

From Baseline Survey

ASIAN ORIGIN TRAINEES BY COMPANY - PERCENTAGE

- CANBERRA 2%
- ULBRICH 6%
- TAYLOR AND FINN
- ENSIGN AND BICKFORD 35%
- CT SPRING AND STAMPING 3%
- WIREMOLD 3%
- ELECTRIC BOAT 4%

FIGURE 9

From Baseline Survey

TYPICAL WAGE RATES

- TOTAL GROUP: $13.44 hourly
- ULBRICH: $14.16 hourly
- ENSIGN-BICKFORD $12.52 hourly
- CT. SPRING & STAMP $16.60 hourly
- WIREMOLD $12.19 hourly
- ELECTRIC BOAT $12.51 hourly

EDUCATION OF TRAINEES

Number= 625

1. 8th grade or less 17%

2. 9th grade-11th garde 24%

3. 12th grade or more 59%

FIGURE 11

From baseline survey

WORKSITE LEARNING ACTIVITIES

Number= 643

1. MATH SKILLS 31%
2. TEAM BUILDING SKILLS 26%
3. READING SKILLS 3%
4. ESL/LANGUAGE SKILLS 23%
5. BASIC SKILLS 17%

FIGURE 12

From baseline survey

PARTICIPATION BY PROVIDER

Number= 643

1. CREC 51%
2. Tunxis Community College 30%
3. Greater Hartford Community College 5%
4. Mohegan Community College 15%

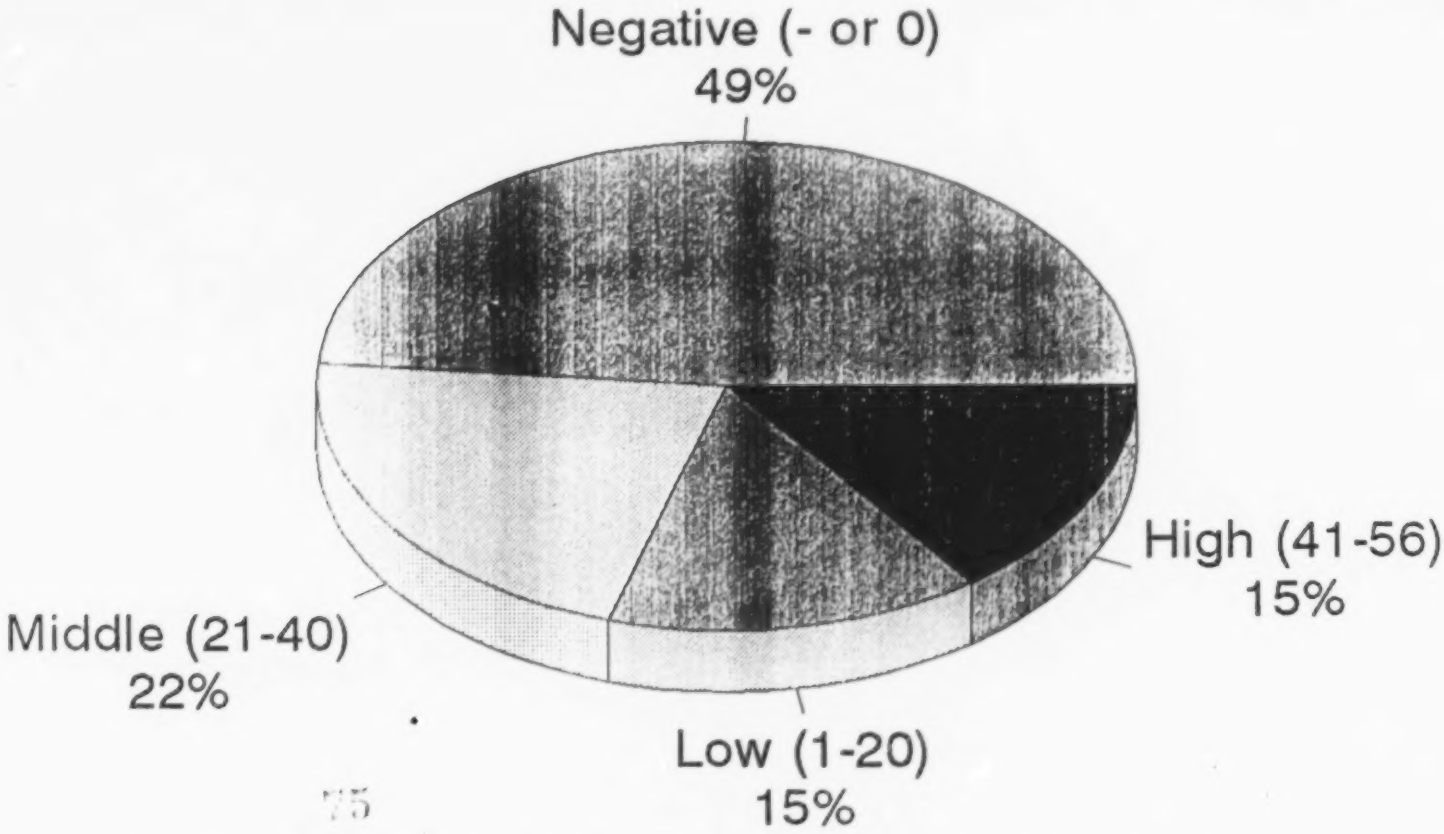
FIGURE 13

From baseline survey

WORKSITE LITERACY ASSESSMENTS

GAIN SCORES (POST-PRE): N=185 for 5 out 7 Companies

FIGURE 1-4



Percentage of Tested Workers Who Gain by Level

Restricted to workers with both pre and post tests --must score 1% or better on tests (0s excluded)

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GAIN SCORES (POST-PRE) IN MEDIAN VALUES

For 5 out 7 Companies:

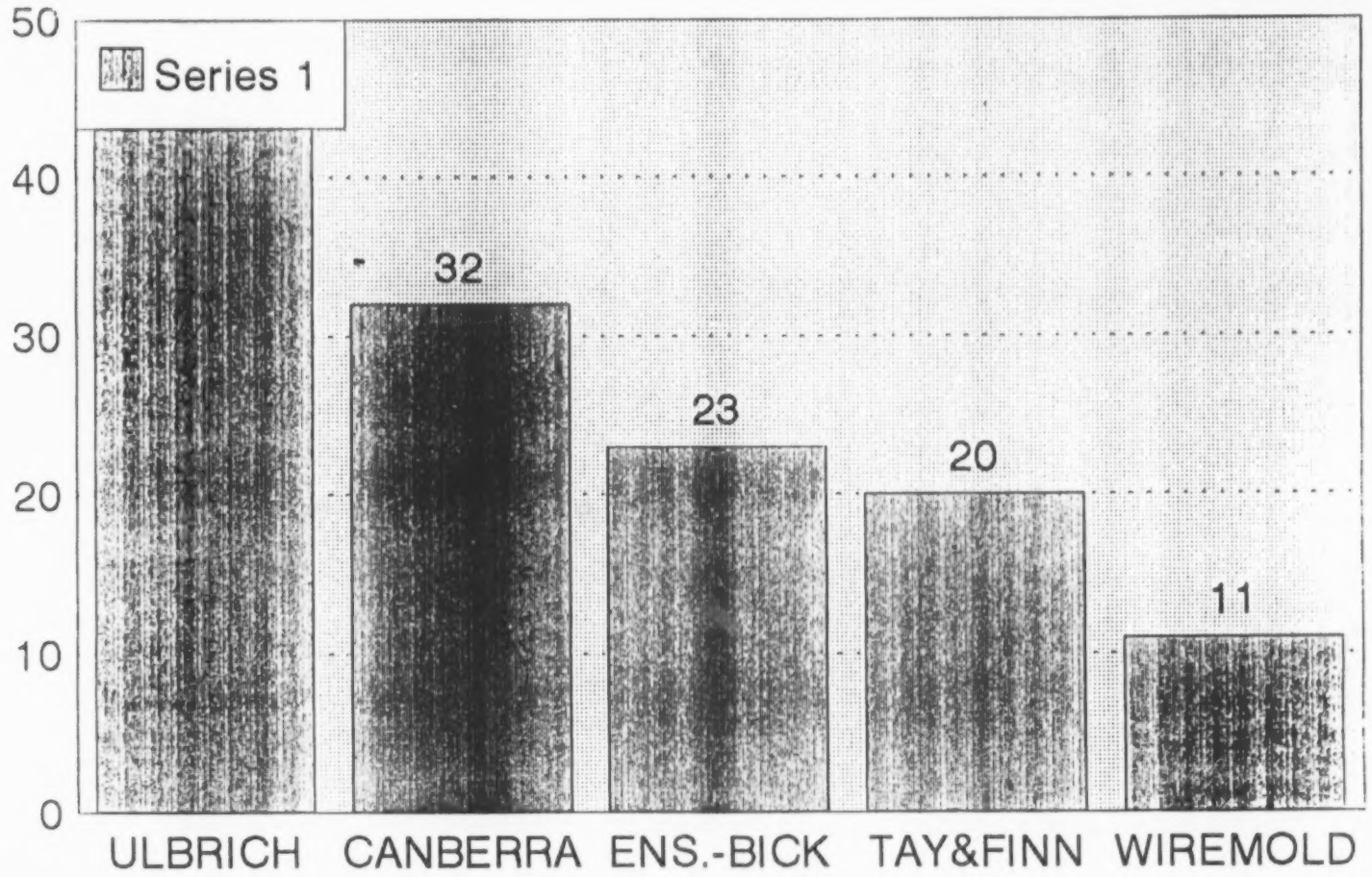

FIGURE 15

Restricted to workers with pre and post tests --must score 1% or better on tests (Os excluded)

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GAIN SCORES (POST-PRE) IN MEDIAN VALUES BY PROVIDER

For 3 out 4 Providers

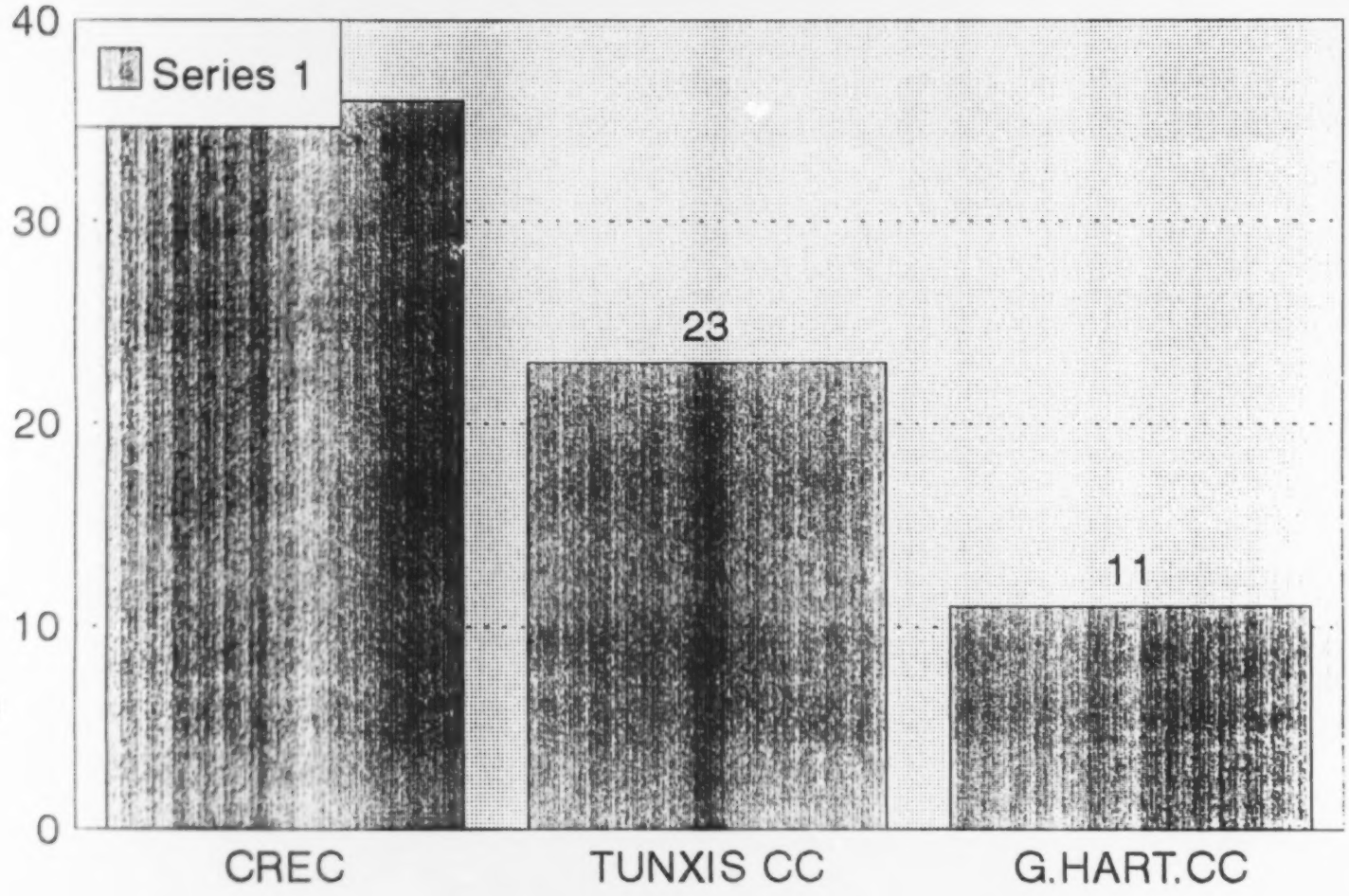

FIGURE 16

Restricted to workers with pre and post tests --must score 1% or better on tests (Os excluded)

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PERCENTAGE OF NO GAINERS BY COMPANY AND PROVIDER

GAIN SCORES (POST-PRE)

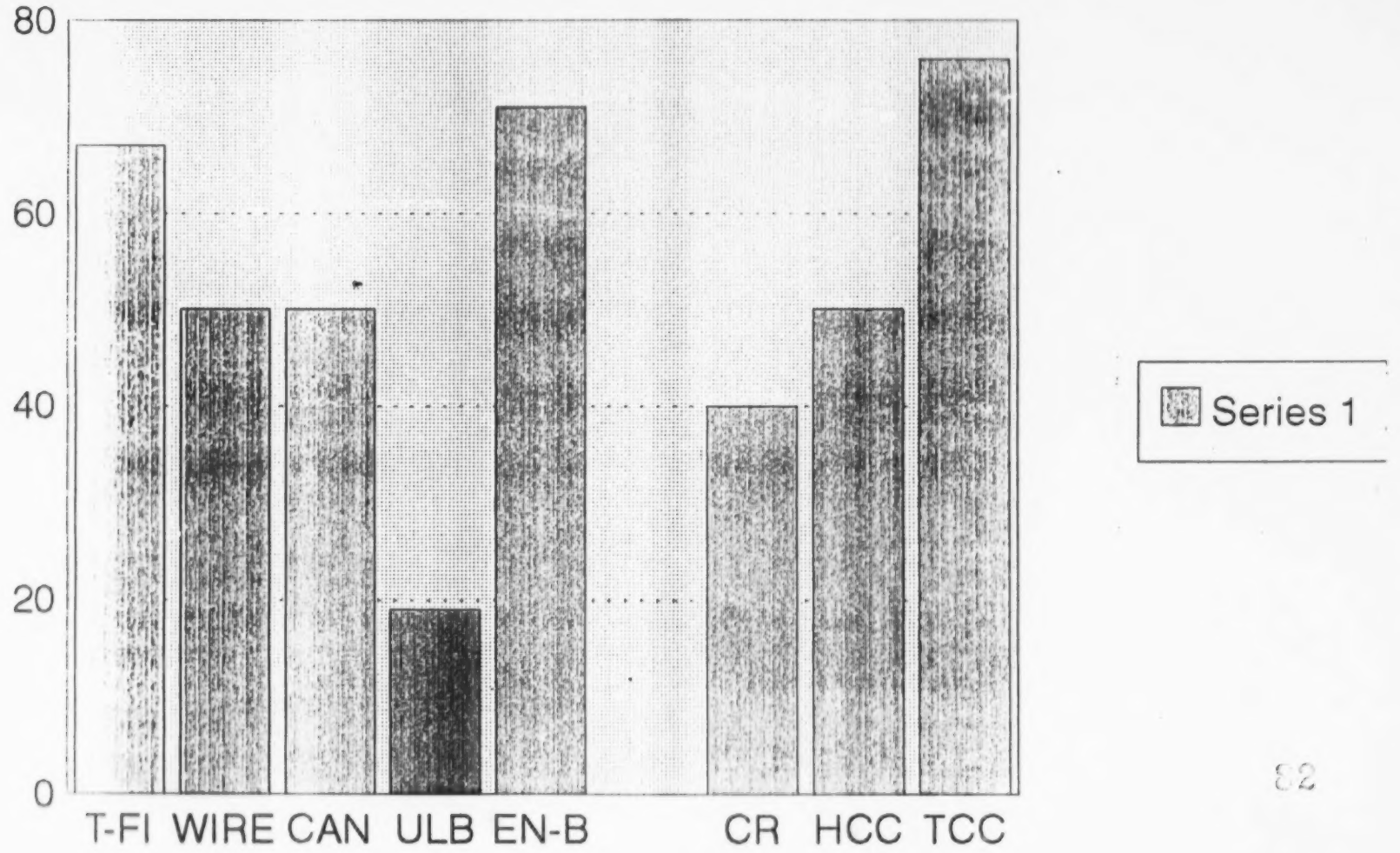

FIGURE 17

Percentage of those with matched pre/post who do not gain. Zeros excluded on pre/post tests.

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APPENDIX D

Article from the CBIA NEWS, September 1991

Workplace programs teach 3R's, plus

On-the-job literacy programs help employees adapt to changing company needs.

By Anne M. Condon

The drive toward total quality management in companies across Connecticut demands that everyone from the chief executive officer to the hourly worker undergo retraining. But at the lower levels of many companies, officials find that retraining is difficult -- or downright impossible -- because their employees lack some very fundamental skills.

That's why more and more companies are sponsoring literacy programs aimed at bolstering employees' basic skills, such as mathematics, reading and writing, and English as a second language. What's more, workplace literacy programs today also encompass non-traditional skills required for successful conversion to total quality management. Those skills include communication, problem solving, analytical thinking, team building, decision making and running effective meetings.

"Technology has increased so much, and the needs of the business community have changed so much, that what we used to consider higher-level skills are now considered basic skills," says Janet Daisley, director of CBIA's Workplace Literacy Project. Using grant money from the state Department of Labor and more recently from the federal Department of Education, CBIA is helping some Connecticut companies develop and implement literacy training projects.

One of those companies is the Wiremold Co. in West Hartford. Arnie Sargis, manager of employee participation, says his company discovered that it couldn't move into total quality management without training its workers. "Jobs are being upgraded. Machines are being upgraded. Workers are being asked to attend meetings and be members of teams," Sargis says. "We just found the basic skills to do these things are not there."

Total quality management involves every worker

Connecticut companies are using many different names and slogans for their total quality management programs, but all revolve around three simple principles: Customer satisfaction is the No. 1 goal, products must be continually improved, and all employees -- right down to hourly workers -- are responsible for the first two.

Every single worker has to keep step in a company's march toward total quality management. Workers who used to sit at a bench repeating one task day in and day out will now have to work in teams and be responsible for understanding every step of the production process. They'll also be enlisted to help devise methods to increase production and improve product quality.

There will be new demands on supervisors too. "Organizational change is a fact of life today,

Singer, director of the Capitol Region Education Council's Adult Literacy Center, which conducts workplace literacy training at several companies participating in CBIA's federal grant program. "We suggest companies present it [the training] as a special thing the company is offering."

Connecticut Spring & Stamping Corp. in Farmington faced communicating its goals to a multiethnic work force when it began reorganizing its workers into teams. "We found that our departments were little countries," says Kathleen Bellemare, the company's director of human resources. So, this past spring Connecticut Spring asked the Tunxis Business Services Center to provide classes in English as a second language. The classes are funded by pilot grant money from the state Department of Labor, in conjunction with CBIA.

Employees were frightened at first, Bellemare says. "They were concerned about why, suddenly, we were asking them to do this. We had to explain to them, through interpreters, that what we were trying to do was help them learn the English language, not only for here, but also for outside work. Secondly, we had to tell them that their company was changing, and they might not have the luxury any longer of sitting next to someone who spoke the same language."

Employees' enthusiasm sells other employees

Connecticut Spring & Stamping is finding, as are other companies with some experience in basic skills training, that employees who go through the programs become their best salespeople. "The first group was so excited by the end of the course that the second group volunteered," says Bellemare, whose company has now begun training workers in math and improving supervisors' communication and team-building skills.

Building employee support for literacy training should also involve formal recognition of those who have completed the programs, adds Nancy Sladyk, administrative services manager at The Taylor & Fenn Co. in Windsor. Her company held a graduation ceremony for the 13 workers who completed a basic English class, and presented each with a videotape of the event.

Another piece of advice from those who have started literacy programs is this: Pay workers for the time they're in classes. "If you're really willing to train people, you should do it on company time so that they know we're all in this together," Bellemare says.

CBIA's Daisley says the training that's being accomplished at these companies as a result of the state and federal grants will have positive consequences for many other companies as well. "We hope to spread the word of what we're doing so that companies who don't know where to turn to start literacy training programs can come to us for advice," she says. "We definitely hope that more companies start looking at these training practices as a way of staying competitive and staying in Connecticut."

APPENDIX E

CBIA

Connecticut **Business&Industry** *Association*

QUARTERLY REPORT -- CBIA STATEWIDE WORKPLACE LITERACY PROJECT

(Project Award Number V198A 10147)

Overview

This is the second quarterly report for the CBIA Statewide Workplace Literacy Project. CBIA's project targets 7 seven manufacturing companies statewide; four that are partners to the USDOE grant (Electric Boat, Taylor and Fenn, Wiremold Company and Connecticut Spring and Stamping Corporation) and three that are project sites (Ulbrich Stainless Steel and Special Metal Products, Canberra Industries and Ensign Bickford).

At each company, I have organized an advisory committee comprised of company personnel (human resources, adult-learner, union representative, supervisors, CBIA project director and education service provider). Coordinated by the CBIA project director, the advisory committees have been instrumental in targeting workers to be tested and trained; have provided information and advice critical to the literacy audit; and ironed out numerous production, human resource and training implementation issues. Literacy Audits have been done for each participating company and detailed, customized curriculum has been developed and is being used for classroom instruction.

All companies are contributing 100% paid, release time for employees participating in the USDOE program. In addition, four of the companies are also contributing considerable financial support to supplement USDOE grant dollars. The companies are also contributing dedicated classroom space, company personnel for program coordination, and miscellaneous supplies, such as awards for recognition.

The project evaluators have visited each site, observed workplace literacy classes in progress, and interviewed adult learners, supervisors and other appropriate company personnel. With the assistance of the companies and evaluators, I am compiling information on the training population (years of service with company, age, educational level, ethnicity, hourly wage, gender) and outcomes of the actual training (hours of workplace literacy training, increases in test scores, qualitative increases in productivity) which will be included in the final report for US DOE in September 1992.

When originally submitted, the CBIA project budget allocated a large share of the overall project's budget to Electric Boat ($90,000) whereas other company partners were slated to receive much smaller training dollars (e.g., $15,000 for CT Spring and Stamping, $15,000 for Wiremold, and $25,000 for Taylor and Fenn). As requested in my cover letter to this report, the overall CBIA grant program would benefit from a reallocation of training dollars from Electric Boat to the other company grant partners.

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Update on Company Partners and Company Sites

Education Service Providers

The education service providers (CREC Workplace Adult Literacy Center and Business and Industry Services Network) have utilized the literacy audits to develop extensive, customized workplace literacy curriculum. The providers have utilized literacy audit techniques such as job shadowing, personal interviews and review of company manuals, operating procedures, and written material in order to compile curriculum for the classroom training.

A major focus of CBIA's grant is on manufacturing companies which, in the process of implementing Total Quality Management (TQM) improvement processes, have unearthed basic skills deficiencies of their workers. Although the TQM program differs from company to company, the TQM process necessitates interpersonal skills (such as team building, communications, analyzing information, etc.) and strong mathematics, reading and writing skills needed for increasingly sophisticated manufacturing jobs.

The education service providers have studied each company's TQM program so that the customized workplace literacy program will increase the workers' ability to perform in a TQM environment. The providers have incorporated "cooperative learning" techniques, communication exercises and problem-solving elements to the math, reading and English-as-a-second language curriculums.

Taylor and Fenn

The training at Taylor and Fenn has been underway since September 1990 and will continue through June 1991. Approximately (30) production line workers and supervisors are participating in an intensive, customized English-as-a-second language curriculum. Taylor and Fenn has identified (15) additional second shift workers who would benefit from an ESL curriculum if funds can be reallocated within the existing grant. The company has also renovated unused factory space for a training room for classroom teaching under the USDOE grant.

Wiremold Company

The training at Wiremold Company has a variety of components. One pilot group of 15 employees, who are organized in a work cell are going through 36 weeks of english, reading, mathematics and problem-solving training. The curriculum incorporates the workplace information that the cell team members utilize throughout a work day. In addition, the pilot group will learn problem-solving techniques utilizing actual problems from the production line. In addition, curriculum has been developed for math and reading courses for 30 additional employees to improve skills for assembly and production work.

Connecticut Spring and Stamping (CSS)

The literacy audit performed at CSS, with the support of the company's CEO and upper management, now serves as the "blueprint" for company training needs. All training, including DOE grant funds and beyond, will be driven by the information and conclusions provided in the literacy audit. The USDOE grant money

has funded a cycle of leadership and team-building skills for supervisors promoted from the line production workers ranks. In addition, (15) employees are also participating in a mathematics course for 12 weeks. CSS would benefit greatly from a reallocation of funds to address additional mathematics and ESL needs.

Electric Boat

Electric Boat, the company slated for the largest share of the DOE grant money, has been the most complex training program to administer. Beset by operational problems, such as labor "downsizing" (1,500 employees) over the past year, serious production concerns with the Seawolf submarine contract (in federal court arbitration), and union/management acrimony over a new labor contract, the workplace literacy program got off to a slow start.

In September, the workplace literacy program's company oversight was shifted to Electric Boat's Apprenticeship School as originally designated in the grant. The Apprenticeship School's commitment to this program has been pivotal in moving the training forward. (5) classes of reading, writing, and mathematics are underway for a number of job classifications and a small group of workers compensation employees. The workplace literacy program is currently serving 60 employees. The training will continue through June, and will be institutionalized within the Apprenticeship School. Originally, the grant targeted a large pool of workers compensation individuals, but due to Electric Boat's freeze on hiring within any positions, the company did not want to include workers compensations employees in customized training for specific job classifications that had no hiring potential.

The training is bolstered by strong union support (Metal Trades Council), the involvement of the Apprenticeship School, Mohegan Community College and CBIA. As indicated in the original grant application, workplace literacy training will be institutionalized as the Skills Enhancement Center of the Apprenticeship School. Although training is underway through the summer, CBIA, in conjunction with the Electric Boat advisory committee, agree that $30,000 of the Electric Boat training funds should be reallocated to other company grant partners. This report includes a request to reallocate $30,000 of Electric Boat's $90,000 budget line item to three other grant partners (Wiremold, Taylor and Fenn, and Connecticut Spring and Stamping) as the full training sum allocated to Electric Boat funds will be unable to be spent during the grant's timeframe.

Canberra Industries

Canberra's training is underway for 80 production workers in the radiation detection division. The majority of Canberra's training will be a customized mathematics curriculum, although the training also includes a team-building component for production employees. The interpersonal skills training became an important component of the curriculum as production workers are newly organized in a cell structure. The small group cell structure has been a difficult adjustment for employees after years of assembly line work. The team-building component was developed to enhance worker productivity and cooperation, and the mathematics course mirrors a cooperative learning style.

Ulbrich Stainless Steel

Ulbrich was the last company to join the USDOE program as a site. The company appointed a new workplace literacy liaison in August which necessitated some regrouping for the time table. The literacy audit was completed in November and customized curriculum has been developed for 13 job classifications. Due to an end of the year production crunch, training will begin the first week of January and be completed by June in the area of mathematics, writing and ESL.

Ensign Bickford

The workplace literacy program at Ensign Bickford will be completed by February. (3) classes of ESL, (3) classes of reading and writing, and (1) class of mathematics will be completed. All training utilized applied curriculum generated from the literacy audit. Over 75 employees received training which will allow Ensign Bickford to begin gearing up for implementation of their Total Quality Manufacturing program. Personnel from Ensign Bickford have also been instrumental in assisting with USDOE program dissemination. Donald Ascare, Training Manager spoke on a panel with me at a statewide National Education Goals conference in November.

Professional Development

Workplace Literacy Roundtable

In September, I organized a Workplace Literacy Roundtable discussion for the grant partners and sites at Wiremold Company. Representatives from four of the companies gave brief presentations on their particular programs. Topics included:

- Developing Employee Participation for Workplace Literacy Training (Wiremold Company)
- Building a Political Process for Workplace Literacy Training (CT Spring and Stamping Company)
- The Connection between Workplace Literacy Training and Implementing Total Quality Management (Canberra Industries)
- Rewarding Employee Participation in Workplace Literacy Training (Taylor and Fenn Company)

The Roundtable provided an excellent opportunity for all grant partners, sites, and service providers to share information, obtain ideas for improving program performance, and gain increased awareness of productivity measures related to the workplace literacy training. The evaluators for the grant, Dr. Andrew Hahn, Brandeis University and John Cimarosa also attended the event.
(see attachment)

Jorie Philippi Workshop

In October, I organized a professional development workshop, conducted by Jorie Philippi of Performance Plus Consultants, for the grant education service providers, CREC Workplace Adult Literacy Center and Business and Industry

Services Network. At no additional cost, I also invited the other Connecticut directors of USDOE National Workplace Literacy Programs to attend.

The full-day workshop covered an extensive agenda, including such subjects as job task analysis, designing and developing customized curriculum, assessment issues and other program related issues (see attachment). The education service providers have been able to incorporate Ms. Philippi's suggestions into their service delivery and are using some of her techniques to enhance program effectiveness.

National Alliance of Business

I attended the National Alliance of Business conference in Washington in October. Staff from the CREC Workplace Adult Literacy Center also attended the conference (although the CBIA grant only paid for the CBIA project director's attendance and one CREC staff members' registration fee). The conference was informative and provided me with a number of suggestions and materials to enhance the CBIA project. The conference also provided me with an important opportunity to meet and talk with other National Workplace Literacy Program directors.

Connecticut Quality Conference

The CBIA grant is predicated upon the need to provide workplace literacy services to manufacturing companies implementing Total Quality Management processes. In November, I attended the Connecticut Quality Council's statewide conference to learn more about the nuts and bolts of TQM, in addition to hearing from presenters who discussed the "skills gap" that is particularly apparent with production workers when management implements a TQM program. Susan Cavallari, Business and Industry Services Network provider also attended the event with me.

Dissemination

I have sought out speaking engagements (within Connecticut) whenever possible to disseminate information on the CBIA grant. I have been a presenter/panelist at the following conferences:

October: Southern Connecticut Chapter of American Society for Training and Development (along with Rosanne Singer, CREC Workplace Adult Literacy Center)

October: Statewide Foreign Language Teachers Conference

November: Connecticut Business for Education Coalition (along with Donald Ascare, Ensign Bickford)

On-going: CBIA's Manager of Media Relations has also set up numerous media visits to newspapers throughout Connecticut to disseminate information on the grant program.

On-going: I am writing a short handbook on "How to Undertake Workplace literacy Training" as a resource for the business and industry community and other interested organizations.

Performance Report for CBIA's Workplace Literacy Grant (4/91 - 8/91)
Prepared by Janet Daisley, Project Director
Award Number V198A 10147

CBIA was awarded the US Department of Education National Workplace Literacy grant in March 1991. The grant is an 18 month pilot program that runs from April 1, 1991 through September 30, 1992. The following is a summary of activities for the implementation of the CBIA Workplace Adult Literacy grant during the first four months of operation:

CBIA Staff

From April 1 - April 15th, Lauren Weisberg Kaufman, director of the CBIA Education Foundation served as 50% time director of the grant. Janet Daisley, deputy director of the Education Foundation was appointed director as of April 15th, serving 50% time from April 15 - May 15th and 100% throughout the remaining grant period. Ms. Kaufman remains Principle Investigator 30% time (10% budget, 20% in-kind).

As project director, I have had considerable experience in education policy, but not specifically in the area of workplace literacy. During the first month of the project, I researched and read extensively about workplace literacy training. I also spoke with other NWLP project directors, including Llyod David, Continuing Education Institute, Bob Bozarjian, Massachusetts State Department of Education, and Susan Imel, Ohio State University.

Service Providers

Between May and June I conducted a series of meetings with the service providers (CREC Workplace Adult Literacy Center and Business and Industry Services Network) to discuss implementation of the grant. Meetings covered topics such as overall program design, procedures for working with companies, implementing a literacy audit, employee identification and assessement (testing), customized curriculum development, and data collection. I continue to meet and speak with the providers on a weekly (and daily) basis.

Evaluator

In May, Anne Wingate, executive director of SCOVE and I completed an initial evaluation plan (see attachment) for the project. Later that month Ms. Wingate withdrew her services from the grant due to a heavy workload and in conjunction with staff downsizing of her organization. I proceeded to speak with other NWLP project officers to identify an appropriate replacement evaluator. After considering a number of options, I chose Professor Andrew Hahn of Brandeis University and his associate John Cimarosa of the North River Company for the program evaluation.

In July, I wrote to Sarah Newcomb, NWLP project officer to request a change of evaluator and also to Sara Staton, Grants and Contracts Officer to shift the evaluation money from the "contracts" line item to the category of "other" so that a contract could be developed individually (not through Brandeis University) so that steep overhead charges could be avoided. During the first week of August I spoke with Sarah Newcomb who gave the go ahead with the change of evaluator.

I also developed two forms for use in data collection. The forms include information on individual employees (educational level, age, ethnic status, and years with the company) and aggregate classroom performance. Data will be collected on employees in each class. Copies of these forms are attached.

Contracts

In June and July, contracts were developed for each company. The contract is a one page document, signed by each company partner or site, the appropriate service provider and the CBIA Education Foundation. The contracts give an overview of services to be delivered, with literacy audit and assessment costs usually rolled into the cost of a classroom module. Each contract includes an attachment further detailing training by the appropriate service provider. The cost of training is usually indicated by a per classroom cost, but attachments to the contract indicate the complete service delivery for each company (e.g., audit, assessment, curriculum

development, meetings with companies, etc.) Each contracts reflect service delivery throughout the period of the grant award (April 1991 - October 1992).

Literacy Audit and Assessment

All of the service providers have completed their literacy audits. Although there are three community college providers (Business and Industry Services Network and CREC Workplace Adult Literacy Center), the audits all followed the same general framework. Indepth interviewing and survey techniques were used to receive input on job competencies from designated production employees, supervisors and human resource staff. On average, participating companies selected 5-7 job classifications to be included in the training. The competencies for these job classifications were these enumerated to provide a framework for curriculum development. The literacy audit assessed skills necessary for present job responsibilities, and those skills and competencies needed in over the next several years. A copy of CT Spring and Stamping Company's literacy audit is attached to provide an example of an audit.

The assessment (or testing) measures utilized by the providers included the Connecticut Adult Performance Program (CAPP), Test of Adult Basic Education (TABE), Adult Placement Indicator, and Literacy Assessment Survey. All testing results are kept confidential by providers; only aggregate test results are available to the companies. Although the majority of testing has been completed, testing will continue for those companies with more than one type of basic skills course. Production schedules, particularly in the smaller manufacturing companies, prevent multiple classes from coinciding during the same time period.

Classroom Training

Classroom training has begun at Ensign Bickford, and all other companies will begin training the first week of September. Most companies preferred to start training in September rather than July or August due to multiple week shut-downs that would interrupt classroom training and

continuity. This training schedule is also consistent with the timetable set out in CBIA's grant narrative. As the average training program (per the grant specifications) includes (3) 12 week class modules (e.g., 36 weeks of training) training will be completed within the grant award period.

Professional Development Plan

Professional development activities will take place over the life-time of the grant (see attached plan). I have organized seminars in a number of areas to be attended by myself and the programs' service providers. To date, seminars include:

Sept.: Roundtable discussion for all participants in CBIA grant (company steering committees, service providers, evaluators, CBIA staff) to discuss issues of workplace literacy training.

October: 1/2 day workshop on Auditing and Assessment Techniques

December: 1/2 day workshop on cultural diversity in the adult classroom

January: 1/2 day workshop on data collection (quantitative/qualitative)

Company Participants (Partners and Sites)

During April and May, I worked with the director of CBIA's Manufacturers Council (grant partner) to identify appropriate companies to include as the three additional sites in the grant.

Throughout May and June the designated service provider and I made numerous vists to the seven companies participating in the grant, four of which are partners, and three of which are sites. They include:

Electric Boat, Groton (Partner), Mohegan Community College, Business and Industry Services Network (Service Provider)

Taylor and Fenn, Windsor (Partner), CREC Workplace Adult Literacy Center (Service Provider)

Wiremold Company, West Hartford (Partner), Greater Hartford Community College, Business and Industry Services Network (Service Provider)

Connecticut Spring and Stamping, Inc., Farmington (Partner), Tunxis Community College, Business and Industry Services Center (Service Provider)

Ulbrich Stainless Steels and Special Metals, Inc., North Haven (Site), CREC Workplace Adult Literacy Center (Service Provider)

Ensign Bickford Industries, Simsbury (Site), Tunxis Community College, Business and Industry Services Center (Service Provider)

Canberra Industries, Meriden (Site), CREC Workplace Adult Literacy Center (Service Provider)

I organized a steering committee at each company that includes human resource personnel, an adult learner, union representative, service provider, myself, and any other appropriate company staff helpful to the project. The purpose of the committee is to generate support for the project at all levels of the company; identify workers to be trained; provide assistance in scheduling appointments with company personnel for the literacy audit; provide information for customized curriculum; assist in identifying training goals and priorities; provide feedback and advice on classroom training; and any other information and assistance necessary to carry out the grant's purposes. Per NWLP requirements, the steering committees at the sites are advisory, rather than policy-making in nature.

In addition, all the companies are committed to providing training during paid, company time. Employees will generally be released for four hours per week during training. Each company has met a 30% match to training dollars, and most companies are in excess of 30% match.

Company Summaries

All companies are providing a high level of support for the workplace literacy training activities. One company though, Electric Boat, has experienced considerable internal turmoil and has had to scale back its participation in the program. Please see the summary on Electric Boat below for additional details.

Taylor and Fenn

Taylor and Fenn is New England's largest foundry. The work environment is extremely noisy and somewhat dangerous as hot iron is cast into molds and heavy equipment transports iron molds and other types of manufactured product. Accurate and effective communication is critical for preventing accidents and improving productivity between non-native and native speakering employees. Taylor and Fenn has a large population of Portuguese employees who will all need to participate in teams by 1992 (per the Total Quality program at T&F). The workplace literacy training program we have developed at Taylor and Fenn is a 36 week ESL course, customized to production jobs within the foundry. 46 production workers and supervisors will participate in the program. Taylor and Fenn had a three week shutdown during July and early August, so classes will begin in September.

Connecticut Spring and Stamping (CSS)

CSS is a specialized wire spring and metal stamping manufacturer. The company has a large number of workers who have been with the company for 15+ years and who have performed the same job throughout that time period. In addition, requirements for moving to a supervisory level have historically had more to do with seniority rather than ability to manage people.

In conjunction with CSS's TQM program, the workplace literacy program focuses on building the interpersonal skills (communication and team-building) of supervisors. In addition, a math curriculum has been developed to teach the types of math skills needed to use statistical analysis in the workplace. A comprehensive literacy audit was performed

in July and the top management of CSS has stated that the task analysis will instrumental in focussing the company's training program over the next 5 years (e.g., skills that are necessary in 1991 and skills that are anticipated to be needed over the next 5 years).

Wiremold Company

Wiremold manufactures plastic "raceways" and electrical outlet fixtures for the building construction industry. The process is presently "low tech" and the company is searching for new ways to make the production process more efficient and cost-effective. Total Quality Management is a high priority in this company; in particular, senior management is seeking to cross-train assemblers and machinists to build a more flexible workforce. Although unionized, the company enjoys a high degree of support and trust with its employees and turnover is extremely low; many of the employees have 15+ years of service. The company is vested in re-training and upgrading the present workforce in light of increasingly complex job responsibilities.

The workplace literacy program we have developed at Wiremold focuses on upgrading the non-native speaking population with customized training developed around an english-as-a-second language curriculum. In addition, a separate set of native speaking employees will upgrade their reading skills. These employees will also participate in a twelve week course in listening and communication skills, followed by a course in basic problem-solving. The literacy audit and assessment were performed in July and classes will begin September 10th.

Canberra Industries

Canberra manufactures radiation detection equipment for both government and private sector use. The main production division (80 employees) must utilize math skills in order to assemble the complex electrical circuitry in the radiation detection equipment. Recently Canberra reorganized its production division into a cell structure whereby 6-8 employees work as a team to produce an entire piece of equipment. This is a radical change from the old production method where an employee was responsible for

one step in the production process, carrying out a repetitive process for installing a single component of the equipment.

The workplace literacy training at Canberra provides one month (September) of team-building and communications training for all 80 employees. From October 1991 - July 1992 all employees will participate in customized math classes to upgrade skills to the levels indicated by the literacy audit (performed in August) and beyond to the skills needed over the next two years at Canberra. The steering committee at Canberra has been very active in identifying "real" work situations to be included in the team-building module and has been instrumental in providing access and information for the literacy audit and assessment.

Ulbrich Stainless Steel and Special Metals

Ulbrich is a specialty metals company that rolls raw steel into specific lengths and tolerances for sale to secondary manufacturing processes. Ulbrich is another company changing its manufacturing philosophy to be more employee centered and interactive. Ulbrich would like to reduce its error rate and math skills play an important role in achieving this goal. The workforce includes a mix of non-native speakers and native speakers with minimal formal education.

The program for Ulbrich includes math skills training for employees who will need to use statistical process control in the near future, previously not a requirement of any production job. The ESL curriculum will address communications and reading problems of productions workers in the plant. In addition, another new requirement for production employees will be to wyrite short production reports. We have also developed a writing skills course to help production (line) employees write memos and brief analytic reports for use by supervisors and senior management.

Ensign Bickford

Ensign Bickford designs, manufactures and markets nonelectric explosive initiations systems, in particular for use in the mining, quarrying, constructions gas, oil industries. Because of the highly volatile nature of its product, strong communication, reading, and math skills are essential for employees within the manufacturing plant.

The training program at Ensign Bickford focusses primarily on upgrading the reading skills of the non-native speakers within six job classifications. In addition, employees from these job classifications will also receive customized math training that includes such concepts as measuring, fractions, decimals, etc. The literacy audit for Ensign Bickford was completed in June and classes began in July for 66 employees.

Electic Boat

Electric Boat has experienced considerable downsizing in the past twelve months. Lay-offs have decreased the worker population by 2,000 - 3,000 individuals over the past 12 months. In addition, manufacturing problems (e.g., serious production flaws in the Seawolf Submarine currently under construction for the Navy) have utilized the remaining workforce on an overtime basis. Electric Boat originally intended to re-train a population of workers compensation employees. Changes in the economy have reduced this pool of employees to a fraction of those originally scheduled to receive workplace literacy training. Furthermore, the workplace literacy program has suffered from union-management distrust throughout the planning and implementation period. These business issues coupled with internal human resource concerns have limited Electric Boat's ability to be accommodate full scope of workplace literacy training originally detailed in CBIA's grant narrative.

The steering committee has met bi-weekly since April. EB has agreed to $30,000 of release time for up to 100 employees. The literacy audit is scheduled for the third week in August. The audit took considerable time to schedule because outside personnel must receive a security clearance in order to enter the shipyard. Exposure to jobs and personnel in the ship

was deemed critical for the audit and development of customized curriculum. Classes are scheduled to begin in September for the following job categories: Welders, grinders, painters, laggers, carpenters and riggers. Inspectors from all these trade areas will be included in the courses.

Electric Boat had also proposed to institute a Workplace Literacy Training Center or incorporate the workplace literacy training into an exsiting training division of the company. Rather than create a separate new institution, the supervisor of the Trade and Apprenticeship School and the supervisor of Management Development and Technical Education for Electric Boat have agreed to jointly sponsor this program, and programs operating after the lifetime of the grant. Both supervisors have been very supportive of training efforts, within the limitations of Electric Boat's downsizing and economic constraints.

Classes will primarily focus on math skills, in particular those math deficiences noted by the Apprentice School program. In addition, reading courses are also scheduled for the previous noted job classifications, targeted at procedures manuels and quality control handbooks neccessary to accomplish their jobs. Workers compensation employees will be included as members of the classes for those job classifications that will have open postings in the next three months. Per my conversation with Sarah Newcomb in August, outstanding training dollars will be reallocated to other partners and sites in the grant through either a budget revision or through a project extension prior to the end of the grant.

Dissemination Activities

I have received numerous requests from companies and organizations interested in learning more about our Workplace Literacy Program and what such a program entails. In addition, the CBIA NEWS has published an article regarding the federal grant program that will be sent to our 7,000 member companies. I will be speaking at two conference this fall to provide outreach for program activities. I will also include company partners, sites, and service providers in my presentation. To date, conference workshops include:

The Connecticut Business Roundtable Education Symposium, November 4, 1991. Workshop includes myself, Ensign Bickford representative and Business and Industry Services Network provider.

The Association for Training and Development, October 28, 1991. Workshop includes myself, Canberra Industries representative and CREC Workplace Adult Literacy provider.

In addition, I hope to develop a short handbook on workplace literacy training for our member companies before the close of the grant period.

Summary

Per the original project timetable (see below) CBIA is on schedule regarding project objectives. In order to meet training objectives for participating companies a budget modication will be submitted to expand services for three companies that received very small training budgets (Connecticut Spring and Stamping, Taylor and Fenn and Wiremold Company). Both of these companies view the task analysis as a document to drive training over the next several years. The revision will move some of the training dollars allocated for Electric Boat for these other training purposes.

In my next performance report (December), I will report on training in progress, including detailed data on curriculum and class progress.

Attachments:
Professional Development Plan
Evaluation Plan
Data Collection Forms
CT Spring and Stamping Company Literacy Audit

EIGHTEEN MONTH PROJECT TIMETABLE

(from page 23-24 of CBIA Grant Narrative)

To give a quick summary of CBIA's activities, the timetable of activities for the grant follows. I have checked off those activities that have been accomplished to date or ahead of schedule. I have provided brief commentary in some instances for clarification.

Pre-Grant to February, 1991:

- ✓ Continued discussion and planning with project sponsors
- ✓ Meetings with state Department of Education and Department of Higher Education to identify providers
- ✓ Continuing needs assessment with Manufacturers Council of Hartford County and Electric Boat
- ✓ Preliminary inquiries for project staff positions
- ✓ Discussions with SCOVE on project evaluation

March 1991 - June 1991

- ✓ Hiring of all full-time project staff
- ✓ Meetings with SCOVE re: process evaluation design (note change of evaluator in performance report)
- ✓ Subcontracting with Business and Industry Services Network with CT Spring and Stamping Corporation and Wiremold Company
- ✓ Subcontracting with CREC for Taylor and Fenn Company
- ___ Development of Electric Boat pilot basic skills program - in progress
- ✓ Recruiting businesses for next 3 Hartford County workplace programs with the Manufacturing Council
- ✓ Establishment of company-based Workplace Literacy Councils where appropriate (Councils are referred to as steering committees)
- ✓ On-going evaluative activities

July 1991 - February 1992:

- ✓ Ongoing workplace literacy programming at CT Spring and Stamping Corporation, Taylor and Fenn - may expand program
- ✓ Ongoing evaluative activities
- ✓ Offering of next 3 Hartford County workplace literacy programs
- ___ Offering of first Electric Boat workplace literacy instructional and support services program - in progress
- ✓ Preparation and agreement upon Electric Boat's action plan for a Workplace Literacy Center in New London (see EB summary for information on this activity)
- ✓ Continued meeting of company workplace literacy councils
- ✓ Brokering of new workplace literacy services through CBIA and the Workplace Literacy Services Coordinator

APPENDIX F

Workplace Literacy

A hand-
book on
workplace
literacy
training

Companies Participating in CBIA/U.S. Department of Education Workplace Literacy Grant

Canberra Industries, Meriden

Connecticut Spring and Stamping Corporation, Farmington

Ensign Bickford Industries, Simsbury

Electric Boat Division of General Dynamics, Groton

Taylor and Fenn Company, Windsor

Wiremold Company, West Hartford

Ulbrich Stainless Steels and Special Metals Inc., North Haven and Wallingford

A Handbook on Workplace Literacy Training

Written by Janet Daisley

The CBIA Statewide Workplace Literacy Program,
administered by the Connecticut Business and Industry
Association's Education Foundation

Purpose of this Handbook

The purpose of this handbook is to:

- provide an overview of workplace literacy training issues;
- provide program descriptions of companies undertaking workplace literacy training;
- provide information on education service providers who develop workplace literacy programs; and
- provide a resource list of materials and publications regarding workplace literacy.

INTRODUCTION

A Changing Workplace

Over the past several years, the CBIA Education Foundation has been contacted by numerous companies that are concerned with the basic skills deficiencies of their employees. Increasingly, companies are finding that the skills needed to remain competitive in today's business environment are becoming more and more sophisticated, especially for hourly and production-level employees. Total Quality Management processes also point to the need for workers with good communication and listening skills, along with a solid foundation in the basics — math, reading, writing and English language.

Traditionally, companies have not allocated financial or training resources for basic skills remediation for unskilled or semi-skilled workers. Research shows that the gap is growing between skills needed for employment and actual worker skills. Between 20 and 30 percent of United States workers (unskilled/semi-skilled) lack the basic skills they need for their current jobs. At the same time, only one out of eight companies provides in-house basic skills training (U.S. Office of Technology Assessment). Closing the skills gap will be an important component in assuring the economic survival of the United States in the coming years.

Role of the CBIA Education Foundation

Workplace literacy training has become one answer to the concerns of business and industry about upgrading the skill levels of their employees. Workplace literacy programs focus on the literacy and basic skills training workers need to gain new employment, retain present jobs, advance in their careers, or increase productivity. In 1990, the CBIA Education Foundation received funding from the U.S. Department of Education to institute comprehensive workplace literacy training for seven member companies (see inside front cover). In addition, the foundation has received funding from the Connecticut Department of Labor to pilot basic skills training in a number of additional member companies.

A major focus of CBIA's U.S. Department of Education grant is the manufacturing companies that have uncovered basic skills deficiencies in their workers, deficiencies discovered as a result of implementing Total Quality Management (TQM) processes. Although the TQM program differs from company to company, it requires interpersonal skills (such as team building, communications, negotiation, etc.) and strong mathematics, problem-solving, critical thinking, reading and writing skills needed for increasingly sophisticated manufacturing jobs. The employees find that workplace literacy training carries an extra bonus. The training, while customized to particular jobs, also improves participants' ability to function effectively in other areas of their lives.

Role of the education service provider

Most companies do not have staff readily available to them to develop a basic skills training program. CBIA has bridged this gap for its member companies by linking up with education service providers who are experienced in workplace literacy and can provide member companies with quality service. Under its U.S. Department of Education grant, CBIA is working with the Capitol Region Education Council's Workplace Adult

Literacy Center and the Business and Industry Services Network of the Community and Technical Colleges.

The education service providers are responsible for the development and implementation of the education component of the workplace literacy training program, including:

- testing of employees who are potential participants for the class;
- undertaking a task analysis to determine the competencies that need to be incorporated in the classroom curriculum;
- developing a customized curriculum;
- hiring and supervising certified instructors; and
- evaluating performance of class participants and instructors.

Whether a company is being served under CBIA's grant programs, or working directly with an education service provider, there are a number of steps to consider when organizing a quality workplace literacy training program.

ORGANIZING A WORKPLACE LITERACY PROGRAM

Getting started

Organizing a Steering Committee

To begin planning for your company's basic skills program, organize a steering committee to provide advice and direction on the program, by including individuals representing your company's Human Resources, Quality Control, Production and Financial Management departments. In addition, the steering committee should include individuals representing the company's union(s), supervisors of the areas from which trainees will be drawn, one or more hourly workers, the education service provider and a representative from any other organization involved in the training program.

Objectives of the Steering Committee:

(1) Identifying the company's goals for the training

It is important for the steering committee to clearly articulate the goals of the training at the start — from senior management to salaried worker — so that clear expectations and outcomes are set for the training.

Specific training goals differ from company to company. Some examples include:

- comprehensive workplace literacy training (reading, writing, math) instituted to improve employees' overall basic skills so they can fully participate in the company's total quality effort;
- improving mathematics skills for line workers who will need to master statistical process control;
- English-as-a-second language and communications and team-building skills so that companies with high numbers of non-native speakers can include these employees in employee work teams and job cross-training; and
- writing courses to enable employees to write short, analytic reports on production quality.

(2) Promoting the program internally

Workplace literacy training is a sensitive issue. No employee will be motivated to undertake the training if he or she believes the training is for "dummies," or if they believe the training will identify them to be laid off or fired due to their inadequate skills. Promoting the basic skills training as "skills enhancement" or "skills building" and identifying the program with larger company goals, such as TQM, can help to alleviate worker anxiety regarding the program.

(3) How to select participants

There are a number of ways to select individuals for training. Some companies seek volunteers for a "pilot" workplace literacy program. A pilot group that includes motivated and enthusiastic participants is the best way to generate additional employee interest and demand for workplace literacy training. The trade-off with a pilot group is that customizing the curriculum to specific jobs can be challenging if participants are from different job classifications. Even with a tightly customized course curriculum, progress can be slow if employees come from a wide range of educational backgrounds.

Some companies choose to use standardized tests to assess which employees should participate in the workplace literacy program. The education service provider can help company personnel identify appropriate standardized tests for selected basic skills training. Certainly the company will gain the most benefit from

the training if participants are from job-related areas of the company and are generally at the same educational level.

When a company is unionized, it is critical to involve the union in recruiting and promoting the workplace literacy program. Trust building is a major factor at all steps of the workplace literacy program.

(4) Logistics and Training Details
The steering committee will also need to decide when to hold the training. Data indicates that participation rates are highest when training is held during company time (whether mandatory or volunteer) and that attrition increases with split time (half company, half employee time) or off-company class times. Other issues for consideration include identifying classroom space and training times that will least affect production or work schedules.

Implementation phase

Literacy Task Analysis

A comprehensive workplace literacy training program should include a formal literacy task analysis. The purpose of the task analysis is to evaluate the types of skills and competencies that are required in order to perform specific jobs. The results of the task analysis form the basis of the customized classroom curriculum.

There are numerous techniques and processes available to perform a job task analysis. The task analysis entails techniques such as job shadowing, personal interviews, and review of company manuals, operating procedures and written material in order to compile curriculum for the classroom training.

Whether your company brings in a qualified education service provider or a staff member from your company decides to perform the task analysis, the following is a basic five-step literacy task analysis developed by Maurice Taylor and Glenda Lewe* (Basic Skills for the Workplace).

Basic Steps of a Literacy Task Analysis

STEP 1: Identify the main duties, tasks or activities of the job based on interview(s) with the employee, employer, or union representative.

STEP 2: Collect information about how the main duties, tasks, or activities of the job are done.

STEP 3: Break down the main tasks of the job into steps or sub-tasks and verify the information with the employer or employee.

STEP 4: Analyze each of the sub-tasks for the basic literacy skills and knowledge required to do the task. Remember that skills such as problem solving and teamwork are just as important in the analysis as the traditional literacy skills of reading, writing and numeracy.

STEP 5: Assemble the job information collected and analyzed in a usable way ready for developing a workplace basics skills curriculum.

Standardized Assessment

One of the most nettlesome issues regarding workplace literacy training is the issue of assessing individual progress. Most adult education programs use some form of stan-

dardized test to assess skill levels in the areas of reading, writing, mathematics and English language ability. Most standardized tests currently being used for adult education focus on life skills and do not contain job-related vocabulary or tasks.

Standardized adult education tests such as the TABE (Test of Adult Basic Education), CAPP (Connecticut Adult Performance Program), and BEST (Basic English Skills Test) can be used to assess participants' general educational level (usually indicated by grade level, such as 4th, 5th, etc.). These tests can be helpful to sort participants into beginner, intermediate, or advanced levels.

One note of caution to company personnel: Successful performance on standardized adult education tests does not necessarily correlate with successful job performance. Therefore, companies should not use the results of standardized tests to make hiring or firing decisions. More information regarding the legalities of using standardized testing can be found in the annotated bibliography at the back of this booklet.

Your company may want to request a customized test, developed by the education service provider, that more specifically identifies particular job competencies and skills.

What is a Customized Curriculum?

The purpose of a customized curriculum is to use job-related materials, with the skill competencies identified in the literacy audit, to improve employees' basic skills. With the assistance of company personnel, the education service provider or trainer will integrate actual work-related documents (e.g., standard operating procedures that utilize mathematics, any graphs or charts that employees must be able to understand, formulas or math conversions necessary for successful job performance) and organize these materials into a classroom curriculum. The customized curriculum moves beyond a generic adult education curriculum to teach basic skills needed in a particular workplace.

Program Outcomes

Evaluation of the program

It's a good idea to periodically assess the success of the workplace literacy training. Upon completion of the first cycle of workplace literacy training (usually 12 weeks), company personnel should meet with the education service provider and members of the steering committee to discuss the progress of the program. A number of techniques can be used to obtain an accurate picture of how the program is operating in the classroom and in the company.

- **Assessing classroom scores to look for learning trends:**

Standardized Tests: As discussed in the previous section, the standardized tests provide a gross measure of participant education level. After 12 weeks, the company should not expect huge gains in the standardized test levels, although the standardized tests may provide some indications of educational progress at this point.

Customized Tests: Another, more conclusive measure, would be pre- and post-test scores from customized tests that closely parallel the classroom curriculum and literacy task analysis. The education service providers can provide more specific learning information

regarding individual performance from these tests. Keep in mind, though, that some education service providers retain confidentiality of records and will provide test scores on aggregate levels rather than on individual performance. This issue should be discussed prior to training so company personnel have appropriate expectations for test results.

◆ **Attitudinal Surveys**

Simple attitudinal surveys, to collect qualitative data regarding program efficiency, can be developed by the service provider and company personnel. These surveys are useful in garnering participant opinions regarding classroom instruction, teacher effectiveness and a host of other variables. In addition, attitudinal surveys can be developed to gather supervisor impressions regarding changes in participants' performance, motivation and skill confidence as a result of instruction.

◆ **Quantitative Production Measures**

Company personnel can also gather data regarding reductions in error rates, absenteeism, product quality, or other production-related measures that may be correlated to participant involvement in workplace literacy training.

◆ **Assessing Provider Performance**

It is also important for company personnel to assess the providers' performance in delivering customized training, supervising the teaching staff, and responding to overall company concerns regarding the training.

CASE STUDIES

CASE STUDIES OF WORKPLACE LITERACY PROGRAMS FUNDED THROUGH CBIA'S U.S. DEPARTMENT OF EDUCATION GRANT:

Connecticut Spring and Stamping Corporation (CSSC)

Connecticut Spring and Stamping Corporation is a manufacturer of specialized springs and metal stampings. The company has a large number of workers who have been with the company for more than 15 years and who have performed the same job throughout that time period. In addition, supervisors who have traditionally been the production decision makers are now being required to lead teams that make joint decisions regarding production schedules and product quality.

The workplace literacy program, developed by Tunxis Community College's Business and Industry Services Center, reflects the goals of CSSC's total quality management program. A comprehensive literacy audit was performed with the support and input of the company's chief executive officer and upper management, and now serves as the "blueprint" for company training needs.

The audit identified skills that were currently needed and skills that will likely be needed over the next five years. The 18 months of training included a component to enhance supervisor interpersonal skills (communication and team-building); a math curriculum which focused on the math skills needed to use statistical analysis in the workplace; and an English-as-a-second-language class to help non-native employees improve their communication skills.

Electric Boat

Electric Boat (EB), a division of General Dynamics, produces submarines for the U.S. Navy. The workplace literacy training at EB has been organized and monitored by a strong steering committee, including representatives from the Apprenticeship School, the Metal Trades Council, the Workers' Compensation Division, Mohegan Community College and the Connecticut Business and Industry Association.

The workplace literacy program, developed by Mohegan Community College, focuses on improving basic skills using a customized curriculum specific to E.B.'s highly technical job classifications. The 18-month program has included continuous cycles of English-as-a-second-language, math, reading and writing skills for workers such as painters, grinders, welders, outside machinists, laggers, carpenters, and pipe-welders. The Electric Boat workplace literacy program will continue to operate as the Skills Enhancement Center after the grant funds expire.

Taylor and Fenn

Taylor and Fenn is New England's largest foundry. The work environment requires that employees pay careful attention in the noisy environment as heavy equipment transports hot iron and other types of manufactured products. Accurate and effective communication is critical for preventing accidents and improving productivity between non-native and native employees. Taylor and Fenn has a large population of Portuguese employees who will all participate in teams by 1992 (per the Continuous Improvement program at Taylor and Fenn).

The workplace literacy training program that CREC WALC has developed at Taylor and Fenn is a 36-week English-as-a-second-language course, customized to production jobs within the foundry. Successful program outcomes include employees who have been promoted to customer service jobs that require English skills; employees conversing in English with supervisors; and their increased ability to interact in teams.

Ulbrich Stainless Steels and Special Metals, Inc.

Ulbrich is a precision reroll strip and wire mill that is supported by four service centers throughout the country. The company specializes in producing strip and wire to exact specifications for the worldwide marketplace, including the aerospace, automotive, electronic, defense, medical, industrial, mechanical and consumer products industries.

Comprehensive education and training programs are associated with the company's Total Quality Management program. The Workplace Literacy Program at Ulbrich primarily addressed the fundamental need for workplace math skills development through customized non-supervisory and supervisory-level curricula, all in preparation for the implementation of Statistical Process Control and further advanced technology training. In addition, a reading program and an English-as-a-second-language program were implemented to increase workplace communication skills.

Pre- and post-program results showed significant skill increases, characterized by increased ability to prevent deviations from quality standards as well as by more rapid error identification and corrective action.

Wiremold Company

Wiremold Company manufactures metal and plastic "raceways" and electrical outlet fixtures for the building construction industry. The company has instituted a Total Quality Productivity (TQP) program in an effort to make the production process more efficient and cost-effective. One of the goals of Wiremold's TQP program is to cross-train assemblers and machinists to build a more flexible work force.

The workplace literacy program at Wiremold Company was developed by Greater Hartford Community College. The training at Wiremold Company has a variety of components. One group of employees who are organized into a work cell are going through 36 weeks of English, reading, mathematics and problem-solving training. The curriculum incorporates workplace information that the cell team members use throughout the work day. In addition, the participants will learn problem-solving techniques using actual problems from the production line. Curricula have been developed for math and reading courses so that employees can improve skills for assembly and production work.

Ensign Bickford

Ensign-Bickford Industries (EBI) is a diversified manufacturer whose leading products are non-electric explosive initiation systems used in the mining, quarrying, construction, gas and oil industries. Due to the nature of the product, strong communication, reading and math skills are essential for the safe production of quality products. Over 75 employees have received basic skills training, which will serve as the foundation for employee participation in the company's Total Quality Management (TQM) program.

The Job Skills Enhancement Program (JSEP), developed by Ensign-Bickford Industries Training Group, used instructors from Tunxis Community College to provide remediation in identified employee skills gaps. A process of job analysis for literacy and math requirements, pre-assessment, counseling, remediation, post-assessment and follow-up was conducted for multiple job classifications within the company. The JSEP encompasses a five-step process: English-as-a-second-language (ESL) for employees with limited English proficiency; basic skills training in math, reading and writing using customized curricula; participative skills training in communications, team building, valuing work force diversity, etc.; TQM skills instruction in pre-control, Statistical Process Control, quality improvement tools, etc.; and team-directed work education. EBI's continuing commitment to upgrade employees' skills has recently culminated in the establishment of a computer-aided instruction lab using state-of-the-art computer-based training for ESL and basic skills remediation.

Canberra Industries

Canberra Industries is a midsize company in Meriden that manufactures radiation detection equipment. In 1991 company management decided to restructure production from an assembly line manufacturing process to a team-based structure.

This restructuring amounted to a radical change from the old production method, where an employee was responsible for only one step in the production process. In addition, employees increasingly were being asked to use math skills as they assembled the complex electrical circuitry in radiation detection equipment. To meet these needs, the workplace literacy training program at Canberra was developed in conjunction with the Capitol Regional Education Council Workplace Adult Literacy Center (CREC WALC).

CREC WALC developed a curriculum that began with team-building and communications training for all 80 production employees. The interpersonal skills training became an important component of the curriculum, as production workers were unaccustomed to such interaction after years of assembly-line work. The team-building component was developed to enhance worker productivity, communication and cooperation.

From October 1991 to July 1992, all employees participated in customized math classes, guided by the literacy audit, to upgrade skills to the levels needed at that time and build skills to the level required to successfully function over the next five years at Canberra. In addition, writing courses were provided to help with developing memos and short, analytic reports. The steering committee at Canberra has been very active in identifying "real" work situations to be included in the team-building module, and has provided access and information for the literacy audit and curriculum.

WORKPLACE LITERACY EDUCATION SERVICE PROVIDERS IN CONNECTICUT

Business and Industry Services Network

The Business & Industry Services Network was established in 1986 as a statewide brokering effort of the Connecticut Community-Technical Colleges. Its objective is to provide businesses in the state with workplace literacy training and education for their employees in order to upgrade their skills. The network is made up of business and industry services coordinators who serve various regions of the state. Since the network's inception, the colleges have trained over 20,000 employees.

Contact:

Judith Resnick, State Director
Community-Technical Colleges of Connecticut
Business and Industry Services Network
61 Woodland St.
Hartford, CT 06105-2392
566-8760

Regional Offices of the BISN

Joanne Kane
Asnuntuck Community College
P.O. Box 68 - 170 Elm St.
Enfield, CT 06082
253-3115

Linda Guzzo
Greater Hartford Community College
61 Woodland St.
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520-7840

Pat Lindsey
Hartford State Technical College
401 Flatbush Ave.
Hartford, CT 06106
527-4111

Joyce Budd
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510 Barnum Ave.
Bridgeport, CT 06608
579-6456

Eileen Stern
Manchester Community College
60 Bidwell St.
Manchester, CT 06040
647-6065

Larry Smotroff
Mattatuck Community College
750 Chase Parkway
Waterbury, CT 06705
575-8242

Fred Andrews
Middlesex Community College
100 Training Hill Road
Middletown, CT 06457
344-2789

David Toth
Mohegan Community College
P.O. Box 629 - Mahan Drive
Norwich, CT 06360
886-1931

Stephen Croncota
Norwalk Community College
Richards Avenue
Norwalk, CT 06854
857-7053

Kay Sevarson
Northwestern Ct. Community College
Park Place East
Winsted, CT 06098
738-6373

Jill O'Hagan
Quinebaug Valley Community College
742 Upper Maple St.
Danielson, CT 06239
774-1133

Joseph Magyar
South Central Community College
60 Sargent Drive
New Haven, CT 06511
789-7068

Susan Cavallari
Tunxis Community College
Farmington, CT 06032
679-9564

Jim Branciforte
Waterbury State Technical College
750 Chase Parkway
Waterbury, CT 06708
575-8242

Capitol Region Education Council (CREC) Workplace Adult Literacy Center (WALC)

The Hartford-based Capitol Region Education Council Workplace Adult Literacy Center has specialized in workplace literacy training since 1987. All training programs developed by CREC are customized to meet the needs of individual employers. CREC WALC offers a range of training services, including English-as-a-second-language, math, reading, writing, problem-solving, and team building and communications.

Contact:

Rosanne Singer
Executive Director
CREC WALC
11 Asylum Street
Hartford, CT 06103
522-9533

Inlingua

Inlingua provides English-as-a-second-language instruction for companies across Connecticut.

Contact:

Susan Joyce
Director
Inlingua
45 South Main St., Suite 100
West Hartford, CT 06107
236-2351

Literacy Volunteers of America-Connecticut

Literacy Volunteers of America-Connecticut (LVA-CT) works closely with community agencies, job training programs, and the state Department of Education's Bureau of Adult Education to provide literacy services to adults through the 18 state-wide affiliates of LVA-CT.

For information on the Literacy Volunteers office in your region, contact:

Betty Anne Cox
Executive Director
Literacy Volunteers of America-Connecticut
30 Arbor St. South
Hartford, CT 06106
236-5466
(800) 345-READ/(800) 345-7323

Literacy Volunteers of Greater Hartford (LVGH)

The mission of the LVGH workplace literacy program is to provide customized one-on-one and small group tutoring in basic reading, writing and English-as-a-second-language in order to address the specific job performance needs of employees within companies located in the Greater Hartford area.

Contact:

John Bohuslaw
Manager of Workplace Literacy Training
Literacy Volunteers of Greater Hartford
56 Arbor St.
Hartford, CT 06106
233-3853

SUPPORTING ORGANIZATIONS

THE U.S. DEPARTMENT OF EDUCATION

National Workplace Literacy Program

The National Workplace Literacy Program, administered by the U.S. Department of Education, is designed to provide financial support to workplace literacy demonstration projects operated by partnerships of businesses, labor, and educational organizations. The program was authorized by the Stafford-Hawkins School Improvement Act of 1988 in response to concerns that an increasing percentage of the nation's labor force possessed insufficient basic skills, and that this situation was adversely affecting productivity and competitiveness in the world marketplace.

Contact:

Sarah Newcomb
Division of Adult Education and Literacy
Office of Vocational and Adult Education
U.S. Department of Education
Washington, D.C. 20202-7242
(202) 732-2390

The CBIA Manufacturers Council

The CBIA Manufacturers Council works directly with manufacturers to provide programs and services; information exchange and networking; and effective grass-roots legislative actions and image enhancement. All of the company participants in CBIA's U.S. Department of Education grant are members of the Manufacturers Council.

Contact:

Brian Beaudin
Director
CBIA Manufacturers Council
370 Asylum St.
Hartford, CT 06103
244-1900

The Connecticut Department of Education

The Connecticut Department of Education (DOE) is a primary leader in the state in the area of adult education. Programs funded by the DOE in this area include English-as-a-second-language, high school completion, basic skills programs, and workplace literacy programs. The department has researched, developed and implemented a statewide testing instrument for adult education providers called the CAPP (Connecticut Adult Performance Program). In addition, the department provides funding, through regional education service centers and local adult education programs, to help defray the cost of workplace literacy training.

Contact:

Roberta Pawloski
Acting Chief
Bureau of Adult Education
Connecticut Department of Education
25 Industrial Park Road
Middletown, CT 06450
638-4035

Connecticut Department of Labor

The state's Department of Labor, through its Office of Job Training and Skill Development (OJTSD), has been instrumental in providing funding and support to Connecticut companies interested in workplace literacy training. The OJTSD also funds a number of additional employment and training programs across the state in its effort to serve Connecticut companies and employees. The Department is a partner to CBIA's Statewide Workplace Literacy Program.

Contact:

Jan Hasenjager
Connecticut Department of Labor
200 Folly Brook Blvd.
Wethersfield, CT 06109
566-2450

The Connecticut Quality Council

The Connecticut Quality Council (CQC), a partner to CBIA's Statewide Workplace Literacy Program, was established in 1990 by representatives of the state's business community who share a common interest in quality. The CQC acts as a catalyst to promote quality and continuous improvement by facilitating networking among members, providing education and training, and promoting Total Quality Management.

Contact:

Alice Heist
Executive Director
Connecticut Quality Council
275 Windsor Street
Hartford, CT 06120-2991
548-2418

The Regional Education Service Centers

The six Regional Education Service Centers provide a variety of adult education and basic skills training services to communities and companies statewide.

Judith Baldwin
Division Director
ACES - Area Cooperative Educational Services
5 Science Park
New Haven, CT 06511
786-5280

Rosanne Singer, Director
Workplace Adult Literacy Center
Capitol Regional Education Council
599 Matianuck Ave.
Windsor, CT 06095
522-9533

David Talbot
EASTCONN - Eastern Connecticut Regional Education Service Center
Northeast Learning Center
111 Connecticut Mills Ave.
Danielson, CT 06239
779-3770

Susan Wallerstein
Director of Learning Services
CES - Cooperative Educational Services
785 Unquowa Road
Fairfield, CT 06430
255-7585

Project LEARN
P.O. Box 220
East Lyme, CT 06333
739-6971

John Mongeau
RESCUE - Regional Educational Services
Concepts through Unified Effort
355 Goshen Road
Litchfield, CT 06759
567-0863

WORKPLACE LITERACY RESOURCES

Basic Skills for the Workplace.
Maurice Taylor, Glenda Lewe and James Draper, editors (1991). Culture Concepts, 5 Darlingbrook Crescent, Toronto, Ontario, M9A 3H4.

This book contains detailed information on basic skills training in four areas: understanding the need for workplace literacy, identifying workplace training needs, examples of practice in workplace basic skills training and discovering approaches for program development.

The Bottom Line: Basic Skills in the Workplace. U.S. Department of Education and U.S. Department of Labor (1988). Employment and Training Administration, 200 Constitution Ave. N.W., Washington, D.C. 20210.

This booklet discusses the need for improved basic skills, and for identifying and solving workplace literacy problems. The booklet also includes a resource list of references, readings and organizations dealing with basic skills issues.

Employers & the Law of Literacy. Business Council for Effective Literacy (No. 17, October 1988). 1221 Avenue of the Americas, 35th Floor, New York, N.Y. 10020.

This article describes the legal aspects of employee basic skills testing and training.

What Work Requires of Schools: A SCANS Report for AMERICA 2000.
The Secretary's Commission on Achieving Necessary Skills, U.S. Department of Labor (1991). U.S. Department of Labor, 200 Constitution Ave. N.W., Washington, D.C. 20210.

This report defines the skill competencies and personal qualities our young people need to be successful in the work force.

Worker-centered Learning: A Union Guide to Workplace Literacy.
Anthony Sarmiento and Ann Kay (1990). AFL-CIO Human Resources Development Institute, 815 16th St. N.W., Washington, D.C. 20006.

This guide gives the AFL-CIO's guidelines for developing a strategy for workplace literacy that will help meet union members' education and training needs.

Workplace Basics Training Manual.
Anthony Carnevale, Leila Gainer and Ann Meltzer (1990). Jossey-Bass Inc., 350 Sansome St., San Francisco, CA 94104.

This manual lays out a blueprint for the successful establishment and implementation of a workplace basics program. The blueprint includes everything from advice on how to win internal political support to the latest information on modifying an instructional system design to fit the individual needs of a company.

Workplace Basics: The Skills Employers Want.
Anthony Carnevale, Leila Gainer and Ann Meltzer (1988). American Society for Training and Development. 1630 Duke St., Box 1443, Alexandria, VA 22313.

This booklet describes the linkages between basic skills and economic competitiveness, the types of skills employers want and strategies for establishing a workplace basics program.

Workplace Literacy Primer.
William Rothwell and Dale Brandenburg (1990). Human Resource Development Press, 22 Amherst Road, Amherst, MA 01002.

This book provides advice about how to identify the basic skills expected of employees; when to use in-house training for basic skills development; how to establish and operate a successful in-house basic skills training program; and other resources for basic skills programs.

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